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TUBERCULOSIS.

its Prevention by the Use of Individual Stalls.

BY GEORGE W. KINNELL, PITTSFIELD, MASS.,
MEMBER OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.



A GREAT DEAL IS BEING written and spoken and done in regard to the problem we have before us, in dealing with and suppressing the disease tuberculosis among our dairy animals. The wisdom and necessity of some definite and radical course of action is admitted by every one who has taken the trouble to acquaint himself with the most ordinary features of the nature and prevalence of the malady. That it has existed among our cattle for a long time we know, and like a fire gathering strength as it spreads we know that of late years the disease has gained gigantic proportions, and is rapidly undermining and ruining the largest herds of our finest and most valuable neat stock.

In this Commonwealth the past year has witnessed the inauguration of a campaign of extermination of the diseased animals, and so far as the work has progressed it has received the indorsement of a large majority of our citizens. So far so good. It is a first essential step towards our goal. But after all it is only one step. Of itself it is but a temporizing measure and gives us no assurance or hope of being even an approximately final settlement of the difficulty. Affected animals are by no means the only source from which healthy ones contract the disease. We still have a constant supply from the diseased human subject against whom no quarantine restrictions have yet been devised. With a continuance of our present system of housing stock and attending to them, if all the tuberculous animals in the State were killed and buried to-morrow, it would not be more than a few years before we would again have an appreciable amount of tuberculosis and in a few years more than that we would find ourselves in practically the same predicament we are in to-day. In order to be successful, the war against tuberculosis must be waged along the whole line; and until stock owners can come to realize the necessity of keeping their cows under entirely different conditions than at present obtain, and until the medical profession can educate the public mind to an appreciation of the necessity of applying to diseased persons a degree of quarantine at least approximately equal to that enforced against diseased cows there will be tuberculosis and to spare both among cows and among people.

In the suppression of this disease there are

THREE ESSENTIAL POINTS

to be borne in mind.
1st. That we shall have reliable facilities for recognizing the disease.
2d. That we shall have the power to slaughter diseased animals when discovered.
These two points we can dismiss with a word. Our facilities for diagnosis are all but perfect. In tuberculosis we have a test harmless to healthy animals, and as regards diseased ones not only wonderfully but fearfully exact. The power of slaughter we already have, nor need we fear it will ever be withdrawn.

But there is a third feature more important, far reaching, and practical than all the rest, a feature which as yet has hardly received recognition, far less the adoption of any adequate provisions for its correction, viz., the eradication of those conditions which make tuberculosis possible, or rather, I should say, those conditions which make the continuance of the disease an absolute certainty.

Of all the various much-talked-of causes of tuberculosis, whether they be hereditary predisposition, system of breeding, heavy feeding, forced milking, filth, bad drainage, or any of the many which can be mentioned, there is not to my mind one or half a dozen put together which in any way approach in harmfulness the injury which is caused by the almost universal system which obtains in the arrangement of the ordinary cow stall. It would baffle the ingenuity of man to contrive a system which would be better calculated to ensure the spreading of a contagious pulmonary disease. There the creatures stand shackled side by side and cheek to cheek, anchored to one spot week in, week out, month after month breathing and rebreathing the same air, coughing and expectorating into each other's faces. What wonder that we have tuberculosis in our herds and what marvel that it spreads?

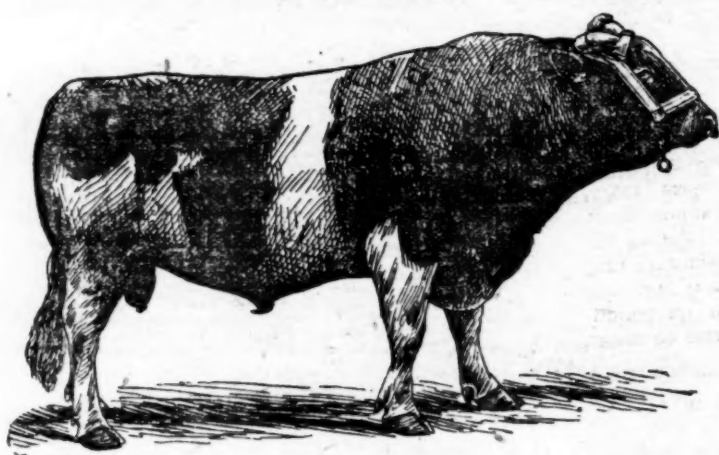
It has been proved time and again that once the disease gains a foothold in a herd it will progress as rapidly in the

cleanest and best-ventilated barns as it will in the dirtiest and least cared for. I do not wish to be understood as decrying the necessity for cleanliness and ample cubic space, but I do claim that their importance is altogether secondary to another requirement which is hardly ever observed, viz., the necessity of to some extent isolating the individuals of a herd from each other.

IS IT CONTAGIOUS?

It is a common saying that tuberculosis is a highly contagious disease. I question the statement very much. My experience leads me to believe that its range of infection is very limited indeed, probably not more than a few feet at the most. For instance, the spread of the disease among animals kept out of doors is practically unknown; or, in other words, diseased and healthy animals can

German Cattle.



"Hector," a black-and-white Holland bull, imported as a calf, and now three years and 11 months old. Received a silver medal at the Berlin Exhibition.—From the *Landwirtschaftliche Illustrirte Zeitung*, Berlin.

herd together in the same pasture with comparative impunity. But, further, let me illustrate what I say by giving what has been a common experience with me in testing diseased herds with tuberculin. Let us suppose we have a herd of 75 cows in which the disease has been in existence four or five years, and let us suppose that 20 or 25 of these animals are diseased. We do not find the diseased subjects sprinkled promiscuously through the herd, here one and there one. No, we find them in clumps and batches, here four or five standing side by side, and there eight or 10 stalls further along another batch of four or five more, with an occasional isolated case between. But let us go further and examine the members of each batch individually. On post-mortem examination we find that almost invariably there is in each batch one animal in which the disease is very much more advanced than in any of the rest and the lesions of much longer standing. Is it not reasonable to say that the case of long standing is the animal from which the other members of the group received their infection? But the breath and infection from this creature were circulating all over the stable in common with the breath of all the other animals in it. If the disease is so far-reaching and infectious, why is it that it did not more generally affect the other members of the herd, and why so especially those in the immediate vicinity of the animal worst affected? Of course, in a herd where the disease is of very long standing and great extent, as, for instance, when 80 or 90 per cent. are diseased, and where healthy animals are the exception, this patchy, clumpy feature cannot be recognized.

AN EASY PREVENTIVE.

In September, 1894, at a meeting of the International Congress of Hygiene and Demography, held in Budapest, Prof. Bang, of the Veterinary College in Copenhagen, read a paper giving the result of an experiment made at the instance and expense of the Danish Government, by which he demonstrated that the spread of tuberculosis in a stable could be prevented by such a simple device as the erection of a board partition between the diseased and the healthy animals. And it was not an experiment on a small scale either. The herd consisted of 208 cows of the red Danish breed, besides bulls, heifers, and calves. By the tuberculin test it was found that 80 per cent. of the cows, 40 per cent. of the bulls, and 40 per cent. of the heifers and calves were diseased. After a careful disinfection, the diseased and the presumably healthy animals were put at opposite ends of the stable and a wooden partition erected between them. This was done in 1892, and since then the healthy part of the herd has been tested every six months, in all four times. By the second test 10 per cent. reacted and were at once put with the originally diseased part of the herd; six months later they were again tested and only one animal in 107 reacted, while six months later the test revealed only two animals in 122 suspected of tuberculosis. The

calves from the diseased cows were, as soon as born, taken and put with the healthy part of the herd. The milk from the diseased cows was used for rearing the calves, but before being fed to them it was heated to a temperature of 65° centigrade. He concludes by saying:

"It therefore seems to me to be demonstrated that it is possible to rear a healthy herd on a farm where there is an infected herd, the two being separated by a wooden partition, and that this will prove successful even when the calves from diseased cows are reared."

Prof. Bang thinks the reason that 10 per cent. among the presumably healthy animals were six months later found to be diseased was because the separation between the two portions of the stable must have been incomplete. I am inclined to think that in this he is prob-

ably in error. In all likelihood the animals were diseased at the time of the first test, but required a second test to develop the reaction. Among diseased cattle there are always some that do not react to a first test, and the number which do not react is very nearly eight per cent. Consequently, the fact that he found a number more on the second and third tests is readily understood and in no way invalidates the fact that a wooden partition is enough to limit the spread of the disease in a herd.

ISOLATION ALL-IMPORTANT.

Why cannot this system be carried to greater length and applied all round? Why not separate each cow from her neighbors by a partition running direct from the floor to the ceiling; or, in other words, have an individual stall for each animal? Over each cow's head let there be a ventilating shaft at least 18 inches square. These shafts could be so arranged that every four or six of them would run together into a common shaft to be carried up through the roof.

It may be argued that the isolation thus obtained would be very incomplete, that the poison-laden breath from a diseased subject could still pass back from the creature's head round the ends of the stall and up into the stalls of the adjoining animals. Very true, but the chances of its doing so, and the extent to which it would do so, are immeasurably lessened by the presence of the partitions and the ventilators; and, besides, in a stall of ordinary depth, before it could reach the next cow's head it would have to pass a distance of at least 10 feet, and this, as we have seen, is probably further than the disease germ can be carried free in the air and retain its potency.

My first ideas of this system of construction were obtained from examining a cow stable on the farm of Mr. John Sloane, of Lenox. This stable measured 70 feet in length, 14 in breadth, and was seven feet from floor to ceiling. It was divided into 14 stalls. This gives a total capacity of 6,860 cubic feet, and after making allowance for partitions, approximately 480 cubic feet per animal. Not a very large allowance surely. The stalls were so arranged that each animal was shut off from direct communication with those on either side by partitions consisting of double thicknesses of matched boards running right up to the ceiling. The stalls were also boarded up in front, but running the entire length of the row and on a level with the cows' heads were folding doors which opened downward into the driveway of the main barn, and through these doors the animals were fed. There were no special provisions for ventilation and the floor, being of wood, and old, could not be kept more than moderately clean. And yet this herd, although it had been exposed to contagion, was by the tuberculin test found to be healthy. The history of it is both interesting and instructive. The 14 animals kept in this stable had been owned on the place for several years. All of the Summer and Fall of 1894 they went in the same pasture and in the

same yards with six other cows which were brought from the State of New York. It was subsequently found that the herd from which the six cows came was a perfect hot-bed of tuberculosis. Consequently, in January of this year Mr. Sloane had the entire herd tested with full doses of tuberculin. Every one of the six new cows reacted, but not one of the original 14. On slaughtering five of these six cows were found extensively diseased, two of them being extremely bad. One of these two worst cases was a cow which had been exhibited and had taken a first premium at the World's Fair, and must have been far gone with the disease at the time of her exhibition.

This feature of having individual stalls for individual animals ought in the construction of a stable to take precedence over every other consideration. While the plan I have suggested is open to criticism on the ground of not being complete enough, yet it is probably as complete as is practicable, is an immense improvement over any other system in general use, and has to recommend it the facts that it can be applied to any of the stables at present in existence, and that at a comparatively trifling cost.

IN REGARD TO THE MATTERS OF CUBIC SPACE, VENTILATION, LIGHT, AND DRAINAGE.

There seems to be among stock owners no clear conception of what is fit and necessary. The whole matter seems to be in a state of fog and chaos and the good features which are occasionally met with seem to be more the result of chance and whim than of well-directed and intelligent plan.

The Board of Health regulations of the City of Boston as applied to dairies require the allowance of 1,000 cubic feet per animal. Dr. Parker, of Haverhill, found from examination of 12 dairies in the vicinity of Boston that the average cubic space per cow was 322 cubic feet, and this may be taken as a fair average of the cow stables throughout the State. Of course the amount of cubic space necessary varies very much with the effectiveness of the means of ventilation, but even with the best ventilating facilities it is never advisable to allow less than 800 cubic feet per cow, and the allowance of 200 or 400 more would, if erring at all, be doing so on the safe side.

In arranging for ventilation, the features to be provided are a sufficient opening overhead to let heated foul air out, a sufficient opening underneath to admit cold pure air, and allowing the laws of specific gravity to do the rest. A shaft 18 inches square over each stall will be sufficient for the first requirement. The best way to admit the fresh air is by the medium of large pipes laid underneath the floor open at both ends outside the building, and communicating with the interior of the stable by means of upright pipes set on at regular intervals, running up through and projecting an inch and a half above the level of the floor. For a stable containing, say, 15 animals, the underground pipe should be three feet in diameter and should bear four upright pipes each two feet in diameter, covered with a suitable grating. The openings should occur in the floor behind the rows of stalls. This insures a constant supply of fresh, cool air and does away with the danger of the much dreaded draft. The projection of the upright pipes above the floor prevents them acting as drainage mediums, and the size of the underground conduit enables a person to pass through and make a periodical cleansing.

HAVE ALL THE LIGHT POSSIBLE.

The consideration of light is also an important one. It is an ascertained fact that the bacillus of tuberculosis when exposed for a few hours to direct sunlight dies, and it is also true moderate light while not killing the bacillus will yet so vitiate it as to render it much less potent in causing disease.

In a stable it is hardly possible to have too much light, and while it should not be allowed to strike directly in the creature's eyes, it should be so arranged as to completely flood each stall. The floor ought to be water-tight and provided with gutters. The whole interior of the stable should be constructed of materials easily cleaned and washed. An ideal stable ought not to have any overhead structure.

In addition to all these we must not forget the necessity for general cleanliness and periodical special cleanings. A special cleaning ought to begin at the tops of the ventilators and be continued down through every part of the interior of the building, including the drains and underground ventilators.

Enter into a paper as this, it is impossible to enter into details, but it has been my object to indicate those scientific lines along which alone a successful war with tuberculosis can be waged.

WEEDS,

And How to Kill Them.

BY LYSTER H. DEWEY.

(From Bulletin, United States Department of Agriculture.)

HORSE NETTLE (*Solanum carolinense*).

The horse nettle is native in the southeastern part of the United States, as its specific name indicates. It is now found in nearly all of the States east of the Missouri River, and is slowly increasing its territory. As the seeds are seldom found as impurities in commercial seeds, and as they have no special adaptation to aid in distribution except that the berries are sometimes eaten by birds, the horse nettle spreads rather slowly. When it has once obtained a foothold, however, it ranks among the worst weeds of this country as regards difficulty of eradication.

It is closely related to the common potato, which it much resembles in its white or purple flowers and yellow berries. The plants are 6 to 20 inches in height, loosely branching, rough, with short, stiff hairs, and armed with yellow prickles. (Fig. 4, a.) The leaves are oblong and irregularly lobed like those of the white-oak. The midrib and larger veins bear prickles like those of the stem, but smaller. The plant is reproduced by the seeds (Fig. 4, c, d), which are borne in the berries, and it is abundantly propagated, also, by slender perennial rootstocks.

The horse nettle is not eaten by any kind of farm stock, even when dried and made into hay, being avoided on account of its sharp prickles and rough pubescent foliage. Ordinary cultivation has comparatively little effect on it, often tending to multiply and improve its growth rather than to subdue it. It is more or less troublesome in nearly all crops and in all soils, but is worst in sandy or loose, friable soils, which are easily penetrated by the long rootstocks.

The production of seed may be prevented by keeping the plants mown. The rootstocks must be killed, however, and this task is about as difficult as killing the rootstock of the Canada thistle; in fact, the methods which are most successful in destroying the Canada thistle may be used with advantage in destroying the horse nettle. Clean cultivation and grubbing or spudding sufficient to prevent any development above ground will starve out the rootstocks. Oats, barley, or millet sown thickly on well-tilled land will weaken the rootstocks, preventing much growth above ground. Immediately after these crops are harvested the land may be plowed and then harrowed frequently until time for sowing crimson clover or winter rye. This will induce the germination of weed seeds, and at the same time expose some of the rootstocks to be killed by the sun. Crimson clover, hairy vetch, rye, or winter oats may be sown to choke down the growth of horse nettle and other weeds during the Fall and early Spring, to furnish winter pasturage, and then to be plowed under



FIG. 4.—HORSE NETTLE.

as a green fertilizer. A hoed crop following, if kept well cultivated, will clear out most of the remaining weeds. The plowshare used in these operations should be kept sharp, so as to cut a clean furrow, otherwise the rootstocks are likely to be dragged and scattered about the field.

BUFFALO BUR (*Solanum rostratum*).

This plant is also native in this country, originally growing on the Western plains, close to the mountains, from Mexico northward. It was doubtless spread to some extent by the buffaloes, as it has been found along the buffalo wallows. While the horse nettle has been slowly traveling westward the buffalo bur has been working eastward, until it is

now found in many States east of the Mississippi River, and has even crossed the ocean, threatening to become a troublesome weed in Germany. It is related to the potato, and closely resembles the horse nettle, but its spines are stouter and more abundant and its flowers are yellow. Instead of the smooth, yellow berries of the horse nettle and potato, moreover, it has spiny burrs, somewhat resembling those of the burdock at first, but developing at maturity into nearly spherical, spiny balls, filled with black, irregular seeds. (Fig. 5, c, d.) These burrs, becoming attached to passing animals, are readily

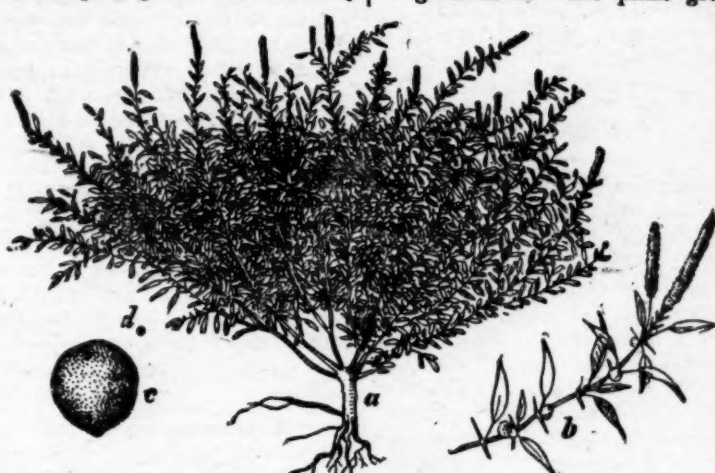


FIG. 6.—SPINY AMARANTH.

scattered. The plant has a lighter, more bushy habit than the horse nettle, and is often blown about as a tumbleweed in the prairie region.

It is an annual, easily subdued by preventing the production of seeds. This may be done by mowing as often as the yellow blossoms appear. The seeds are less abundant than those of

broken ground like other amaranths, but, unlike most of them, it also grows and even spreads aggressively in strong blue-grass sod. No farm stock will eat it, at least after the spines begin to develop.

Like other annuals it may be subdued by preventing the production of seed. It would readily succumb to thorough cultivation, as it grows rather slowly at first and does not produce seed until mid-summer or later. Mowing or grubbing up the plant before the flower spikes develop is probably the best method of eradication in permanent pastures. Potato land and corn-stubbed may be plowed or thoroughly disked after the crop is harvested, and a winter crop sown which will keep down the weeds.

most of the bad annual weeds, and they are not often ripe, at least in the northern part of its range, until after the hurrying work of harvest is over. The buffalo bur is seldom troublesome in fields where thorough cultivation is practiced. The seeds may be expected as impurities in alfalfa and clover seed grown in the West. So far as known, however, in the East this weed has appeared in waste places in cities and towns and has spread thence to the surrounding farms.

In this respect the buffalo bur is typical of a large number of introduced weeds, which are neglected on the waste land in villages and cities where they do no direct and manifest injury. The Canada thistle and spiny amaranth are growing on many vacant lots in Washington. The prickly lettuce first became abundant in Michigan and Ohio in the cities of Detroit and Toledo. The Russian thistle is now growing unchecked, save by the occasional botanical collector, in many localities in and about Chicago. Similar instances might be multiplied; in fact, probably the majority of the cities and towns of this country are harboring noxious weeds which should be destroyed in simple justice to the farming communities which aid most directly in supporting the prosperity of these towns.

SPINY AMARANTH (*Amaranthus spinosus*).

The spiny amaranth, or prickly careless weed as it is often called, is native in tropical America, and seems to have been first introduced into this country along the southeastern coast. It is now more or less abundant in most of the States south of the Potomac and Ohio Rivers, and is spreading with considerable rapidity. It resembles the common tumbleweed (*Amaranthus albus*) and other amaranths or careless weeds of the neglected cornfield and garden. It is an annual with a succulent stem, branching profusely throughout and attaining a height of 15 to 30 inches. (Fig. 6, a.) The leaves are dark-green,

lance-ovate, smooth, about one and a half inches long. At the base of the leaf stalk in most cases are two slender sharp spines, one-fourth to one-half inch long. (Fig. 6, b.) The small, green flowers are crowded in slender spikes at the ends of the branches and in dense clusters in the axils of the leaves. (Fig. 6, c.) The seeds, born singly in the flowers, but aggregating several thousand on an average plant, are black and shining, round or slightly flattened, and about one twenty-fourth of an inch in diameter. (Fig. 6, c, d.) They might be found in clover seed, millet, or grass seeds. The plant grows in

Westward Ho!
EDITOR AMERICAN FARMER: If Mrs. Harry Tappan, of Reynolds, Neb., and Mr. Peter Fraley, of Johnston, N. Y., who inquire for cheap farms in Maryland in July number of THE AMERICAN FARMER, should desire to escape from the Arctic region where they now live and turn their eyes to our sunset land of Summer throned by the great Pacific Ocean, they can find homes that cannot be equalled in any other land on earth so far as markets, soil and climate are concerned. The lowest point registered by the thermometer here last Winter was 23 above zero. Here we have but little snow, no thunderstorms, and a failure of crops was never known. Land, owing to the hard times and so many people having mortgaged their farms previous to the "sound money" crash, can be bought at one-fourth its real value, in some cases less than the improvements cost.

The writer is not a real estate agent, and has no desire to boom other people's property. Still, he deems it a duty to let people who desire homes know where such can be found in a land whose climate and resources are unequalled on earth.—W. A. PERRY, Secretary Sumas Valley Horticultural Society, Van Buren, Wash.

Impurities of Clover Seed.

The Ontario Experiment Station has examined a large number of clover seeds and finds that some samples contain as high as 4,540 weed seeds in one-half ounce of clover seed, while others show as low as one weed seed to one-half ounce of clover seed. Its list is quite complete, and somewhat startling in respect to the impurities which it contains, although the great bulk of the samples tested showed less than one per cent of weed seed.

The investigator states that if seed are scattered upon a piece of black cardboard the foreign grains can be easily detected. The vitality of the samples tested, in a great proportion of cases, stood above 90, and that in only one or two cases did it run markedly low.

Wide Tires in Pennsylvania.

A law known as the Harvey act has been passed by the Legislature of Pennsylvania, with the object of promoting the use of broad tires on heavy wagons. It provides that those owning and using draught wagons with tires not less than four inches in width for hauling loads of not less than 2,000 pounds shall receive a rebate of one-fourth of their assessed highway tax, the rebate not to exceed five days' labor on the roads in any one year. This is only a modest step in the maintenance of good roads, but nevertheless one to be commended.

POULTRY, PIGEONS & PET STOCK



FEEDING POULTRY.

The Foods, Their Value, and How to Use Them.

(BY W. P. WHEELER, OF NEW YORK EXPERIMENT STATION.)

YOU HAVE ALL doubtless heard mention of farms in more or less indefinite and remote localities where the practiced science of poultry-keeping is to permit a few hardy old fowls, recently escaped from the holiday slaughter, to hide about the farm buildings, roost on the moving machine, and perpetuate their species if a few nests could be kept out of sight for the necessary three weeks. The full 21 days are necessary, for two weeks or even 18 days of incubation will hardly suffice to keep eggs out of the market, as some of us have at rare intervals had occasion to note. Some 40 or 50 years ago, I am told, these orthodox methods were not disturbed by many exceptions; and, if my memory serves me rightly, I suspect at even this day I can lead the way to a farm or two where the fancier's influence has not been dominant. A woman might sometimes feed a hen and her chicks, but a man was not expected to give any of his valuable attention to hens other than to throw a club at any attempting to get a taste of the corn so carefully saved for the hogs. The man who fed his hens or built a house for them was regarded as an imbecile, and compassion for his weak mind would be the only consideration besides contempt extended to him.

Fortunately, a few fanciers of independent mind, and of importance enough that their neighbors could not afford to sneer at them, now and then were sufficiently interested to encourage the breeding and exhibition of fowls good enough to win their way to popularity. It is not uncommon to see feeding rations laid down on paper and stated with the same unmodified air of certainty and precision that would be used in mentioning the number of ounces in a pound or inches in a foot. Some of these writers ignore or forget the fact that even the chemist, with a laboratory at hand, could not follow the rules they lay down as established laws of nutrition, for the methods of analysis used to determine the constituents of feeding stuffs are not accurate to such narrow limits. In order to establish and assure our knowledge of the functions and values of foods, it is very desirable that many results of feeding be reported, with records of all the details and circumstances that can be kept account of.

In order to have a general rule that will assist us to give suitable rations, and that will cover the use of all ordinary foods, feeding standards have been made. In devising the feeding standards for most animals, much carefully collected data has been available, but not enough is known at present to enable one to formulate any closely limited feeding standards for poultry. The feeding standards do not represent or stand for any narrowly defined natural laws of nutrition. To a large extent they simply represent averages of those rations which have been most successfully used. Familiarity with the feeding standards does not in any way take the place of experience and personal supervision of the animals fed, and a knowledge of rations that have given good results does not relieve a man from the necessity of studying the capacity of his animals nor the local conditions surrounding them. For a cow of about 1,000 pounds weight while in milk, there is required, according to the estimate of those who have especially studied the subject of feeding, from 30 to 80 pounds of food containing 25 pounds of organic matter, 25 pounds of digestible protein, 13 pounds digestible carbohydrates, starch, sugar, etc., and five pounds of digestible fat. The cow would probably give 30 pounds of milk containing 3.8 pounds of milk solids requiring on the average seven pounds of dry matter in food to each pound of milk solids produced. One thousand pounds of laying hens of about six pounds each, would require from 40 to 50 pounds of food per day, less bulky than that for the cow, containing about

or controlled. In reporting average results it is, of course, often necessary to use decimals of several places to show differences, but the fact is that not enough is known to justify any such finely-drawn lines as are sometimes marked out.

If only two or three kinds of foods were ever available, it would not for practical purposes be of use to more than consider each food as a whole, but inasmuch as many quite different foods are at different times available and vary much in market price, it becomes necessary to know whether the good results obtained from certain foods may not be also obtained from combinations of other foods.

In order to compare foods with any degree of certainty, it becomes necessary to know something of their composition if we wish to feel confident of the possibility of substituting one for another with success. In practically considering the nutrition of animals, it is not necessary to go back of the compounds formed already by plants from inorganic materials.

The animal body consists principally of four classes or groups of substances, viz., water, ash, fat, and protein.

Water constitutes from 40 to almost 70 per cent of the weight of most animals.

The ash or mineral constituents form a considerable part of the bones and a small part of the other tissues.

The fat varies much in amount, and may form a third or more of the weight.

Protein is the name used for a group of similar substances, like the dried white of an egg or washed lean meat.

These compounds are found in the organic part of the bones, in the ligaments and muscles, skin, feathers, internal organs, brain and nerves. Protein compounds all contain from 15 to 18 per cent of nitrogen, not found at all in the other compounds.

The classes of constituents in plants are not greatly different from those in the animal body. The protein substances are in some respects the most important, for nothing else can supply the nitrogen necessary for growing fowls and laying hens and the necessary repair of the muscles and internal organs.

Besides the ash and fat there is the woody fiber of plants—not so necessary to fowls perhaps as to ruminants—and the nitrogen free extract, including the starches, sugars, and some similar substances.



WHITE COCKER HEN.

stances. The fiber is less digestible with most animals than the nitrogen free extract. These carbohydrates serve as sources of fuel and energy and also of fat in the body, as does the fat also in foods.

In feeding most animals it is not necessary to consider the amount of the ash constituents, for the ordinary foods contain all that would be needed, but the demand of a laying hen during the period of most rapid egg production for lime to supply material for the eggshell is so great that a special effort is necessary to furnish food rich in lime. When grain constitutes the greater portion of the food, it is found of advantage to give oyster shells or some form of carbonate of lime to supply the deficiency.

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In order to compare foods with any degree of certainty, it becomes necessary to know something of their composition if we wish to feel confident of the possibility of substituting one for another with success. In practically considering the nutrition of animals, it is not necessary to go back of the compounds formed already by plants from inorganic materials.

The animal body consists principally of four classes or groups of substances, viz., water, ash, fat, and protein.

Water constitutes from 40 to almost 70 per cent of the weight of most animals.

The ash or mineral constituents form a considerable part of the bones and a small part of the other tissues.

The fat varies much in amount, and may form a third or more of the weight.

Protein is the name used for a group of similar substances, like the dried white of an egg or washed lean meat.

dry matter, one pound of eggs being produced from about three and four-tenths pounds water-free food, one pound of dry matter of eggs for each eight and eight-tenths pounds water-free food.

These rations are stated at the rate for each 1,000 pounds live weight fed, to compare with the standards which have been used in recent years for guides in feeding other animals. It must be remembered that, in offering these suggested rations for laying hens, while, so far as the consumption of food is concerned, and the constituents in it, quite a number of records have been used to average from, there are few data available in regard to the digestibility of food by hens. I have never been able to find record of any digestion experiments that have been made with any kind of fowls. Indeed, while the digestibility of food by hens can be determined, it cannot be in the direct, and in some respects simple, manner that digestion experiments with cattle and sheep are conducted. The per cent. digestible of the different constituents of the foods is necessarily at present only estimated, and has not been determined by experiment.

Per hen, the amount of food required per day would vary somewhat with the season and according to the size of the hen. A smaller hen will eat more in proportion to weight than a larger one. When laying the difference in amount of food consumed by larger and smaller hens would be less than at other times, when only enough need be eaten for maintenance. A Cocker or Brahma hen, when laying, would require about four and one-quarter ounces of food per day, of which three and one-quarter ounces would be water-free food. A hen of Leghorn size, when laying, would require about three and one-half ounces of total food, or about two and three-quarter ounces of water-free food, per day.

When growing young fowls from the shell a much larger amount of food in proportion to the live weight is required by the young chicks than by the older fowls. A number of feeding experiments made at the Geneva Station showed that the water-free food required for every 100 pounds of live weight fed was at about one pound average weight, 10.6 pounds; at two pounds, 7.5 pounds; at three pounds, 6.4 pounds; at four pounds, 5.5 pounds; at five pounds, 5.3 pounds; at six pounds, 4.9 pounds; at seven pounds, 4.7 pounds; at eight pounds, four pounds; at nine pounds, average weight 3.3 pounds; at 10 pounds, average weight 3.3 pounds. The amount of fresh food equivalent to these weights of water-free food would be somewhat greater.

Young hens, especially of the better laying breeds, when in full laying should be fed very liberally, and can be freely fed all they will readily eat without much risk, but older hens and the young ones when not laying should be fed only enough to keep them ready and eager for food.

Exercise is of paramount importance, especially for laying and breeding stock, and a good way to assure this, and perhaps the best in winter time, is to scatter the grain for them in straw or hay or any clean and dry substitute.

No substitute is equal to a good grass run for fowls in summer except absolute liberty in large fields. Where it is necessary to confine fowls in yards too small to produce grass, chopped clover, alfalfa, cabbage, etc., can be fed to advantage.

One great advantage of keeping hens separated in small lots of a score or less in each is the possibility of feeding each lot according to their needs and keeping the laying hens separate from those not laying. Whether because of the more careful feeding or other causes, it is seldom that so good results as those secured from small flocks can be obtained from larger ones.

ABOUT HENS.

Light-Brahma-Leghorn Cross—Feeding.

Cholera.

We keep hens for profit. Although I like to take care for them, I would not do the amount of work they require if I thought there was not any profit in them.

I do not know how much it costs to keep a hundred hens a year, but if the feed was all in one pile it would be a large one. We keep the hens in a yard until noon. By doing so they do the most of their laying in the henhouse, but it costs more to keep them this way. We think it takes at least one-half of the money we get for the eggs to pay for their feed.

Our fowls are a mixture of light Brahmas and White Leghorns. We try to raise half as many pullets as we want hens in the winter, and sell the hens when they are two years old. We do not like to keep them after they are two years old; they lay larger eggs, but not as many, and extra size is not much of an object to the producer as long as eggs are sold by the dozen.

Last year we kept about a hundred, and during the year they laid 944 dozen eggs. We sold 770 dozen for \$114. The price ranged from 10 cents to 28 cents a dozen.

We cannot make our hens shell out eggs as I read of others doing. Maybe if we devoted our whole time to them we could learn their needs and have them do better.

We usually give our hens a breakfast of cornmeal and middlings, fed dry—if it is mixed with water or milk the tendency is to use too much water—and at night a feeding of different kinds of grain, but they like corn and wheat the

best. It is better to warm it in cold weather. We also give them green food often; they are very fond of beets and cabbage. We aim to change their food and give them as great a variety as possible. They have ground oyster shells where they can help themselves. The fresh-meats bones are all dried in the oven until they are brittle enough to pound easily, then fed to them; they make the hens sing very loud, but do not know whether they do any more than that. The broken dishes are also pounded, but we do not have many of these, as a careful woman washes them. I have read about using glass, but that is so sharp we have felt afraid to try it.

A yard for hens ought to be so the water will not stand on it, for if it does the hens will drink from the puddles, when they have fresh water in clean dishes, and bad water cannot be healthy for them. It is hard work to get things arranged to perfection, even around a henhouse. I have read about putting carbolic acid in the drinking water. I can put the acid in the water, but I cannot make the hens drink it, and it was not strong with the acid.

We lose hens with the so-called cholera, the symptoms of which are sulphur-colored droppings, loss of appetite, with a crop full of food, loss of flesh, then death. I think liver disease is a more appropriate name. I think there must be a great deal of the same disease through the flocks in all sections, or there would not be so many inquiries for remedies for it. I try nearly all of the remedies I see recommended, and make compounds of my own, but with very indifferent success. I have held postmortems on some of them, and when I saw the liver I think an axe in the first place would have been the best remedy. The liver of one was large enough for four, and very light-colored; another was too dark, and so tender it would hardly hold itself together, but not enlarged; the liver of another looked natural. I did not examine any part but the liver.

I never have had a case of roup and do not care for any. I never have had many chickens troubled with the gapes, but a very good remedy is to take equal parts of wood ashes, black pepper, and salt, and put a pinch of it down the chick's throat. If one dose is not enough repeat it; it will not hurt them.

To keep the henhouse free from lice, I use wood ashes, taking pains to throw them against the sides of the roosting-room and in every place where one thinks they will gather; I do it two or three times a week. For lice on chickens it is a good way to grease every part of a hen the chickens will come in contact with. We do not do anything for lice on hens, only to give them dry dirt to scratch in.

The hens' droppings at night are all saved and mixed with dry dirt and plaster, and used as a fertilizer, usually on corn; sometimes wood ashes are mixed with them just before using.

We take a number of papers, but THE AMERICAN FARMER is at the head of the list, in my opinion.—P. E. C., Kearsarge County, N. Y.

Corn Meal, Oil Meal, and Bran as Feeds.

The report of the Wisconsin Agricultural Experiment Station for 1894 contains a full discussion of the comparative feeding values of linned meal, corn meal, and wheat bran for milk cows. A test was made at the University farm in 1893, the result showing that there was a gain of live weight on bran over corn meal, and on oil meal over bran. No material difference was shown in the influence of the three feeds on the production of milk, though oil meal gave slightly the best results, the results from corn meal and wheat bran being practically the same.

Wheat bran is, according to Wisconsin prices, the cheapest of the three feeds, and as it produces nearly, if not quite, as much milk or fat, it is by far the most economical. The dietetic value of oil meal is, however, of importance. It furnishes a variety to a ration, and makes it more palatable, but should only be used in small quantities.

Meal of Sunflower Cake.

Sunflower cake has been found, especially in Russia, one of the best auxiliary cattle foods. As early as the year 1866 about 100,000 centers of sunflower oil were manufactured in Russia, and its amount has increased very by year, it being esteemed as a very palatable alimentary oil. The oil was formerly obtained by hydraulic means; the residual cake is harder than any other variety of oil cake, and for this reason apparently it has not found a wider application. Denmark and the northern countries import large quantities annually, as do also the eastern provinces of Germany, and the problem of its disintegration has been successfully solved by several manufacturers there. It is still unknown in southern and western Germany, however, that it is put on the market in the form of meal it will doubtless soon find general application, suited, as it is, both on account of its composition and pleasant taste, for fattening cattle. The percentage of protein varies between about 30 to 44 per cent, the fat between about 9 to 18 per cent. It is possible to prepare two qualities, one rich in protein and poor in fat, and the other rich in fat and poor in protein. When, for example, the somewhat finely-ground meal is sifted, employing a mesh of 1mm, that which passes through is much richer in protein and poorer in fat than the original, while the reverse is true of that which remains in the sieve.

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THE APIARY.

Humming.

Mr. Cowan estimates 52,000 beekeepers in England and Wales.

When bees are moved a distance of over two or three miles there is no danger that they will return to their old location.

A good way to keep moths out is to have the entrance as small as possible, which gives the bees more chance against their enemies.

In handling honey, have water and a cloth at hand. A little care to keep things clean, saves much annoyance and trouble in the end.

Few, if any, things can be done well in a hurry. Handling bees certainly cannot. You will always do better if you take plenty of time.

Farmers in northern Illinois are beginning to experiment with alfalfa, though previously it has been supposed the conditions in that part of the State were unfavorable to its successful growth.

No large trees should be near the apiary. Have some small, smooth trees near-by for the bees to cluster on, but they should not be allowed to get over 12 feet high.

Honey should be left with the bees until ripe enough to keep. If extracted while raw, or very thin, it will soon take a strong, rank taste, and be worth only about half price.

When uncapping honey for extracting fasten a whetstone to the place where you wipe your knife. In wiping over the stone, the knife is kept to a keen edge.—Mr. Schaeffle, Cal.

Beekeeper Ogerlin, of Santa Ana, Cal., does not believe in the day of small things. By the end of April he took one and a half tons of honey from his hives in three extractions.

"Why was the bee selected as a model of industry?" said Tillingshast. "Because business with him is always humming," replied Gildersleeve.—Judge.

Spring wagons, or a wagon with much hay or straw, should always be used in moving bees, as they should be jarred as little as possible. Rough handling may move the frames or break out the newer or poorly-fastened combs.

To provide shade for hives standing in the sun we are advised to cut long grass and pile it on the hive six inches or more deep, anchoring it with two or three sticks of stovewood. If cover and all are lifted it will last through the season.

The ancient Romans believed that bees originated from the decaying carcasses of cattle. Possibly this belief was held even earlier. Samson found bees in the carcass of the lion, and propounded the riddle to the Philistines: "Out of the eater came forth meat, and out of the strong came forth sweetness." (Judges, XIV.)

A Vexed Question.

Shall honey be disposed of among the producer's friends and neighbors—the home market—or sent to the commission merchants in the nearest city?

The city market has often been found unsatisfactory, for many reasons; the risk in shipping is great, the market is sometimes overstocked, and the busy commission merchant is unable to give to each consignment the attention desired by the producer.

Of the home market Mr. York says: "I fully believe that the best solution of the question will be found in the home market, where the producer can personally look after the details of the work; and although unable to do the actual retailing himself, he can so supervise it as to realize the largest proceeds from the sale of his crop of honey."

"As to the price to be asked, certainly the city market quotations should not govern, for, as I have shown, that market may have become overstocked, and for the time being the price lowered to such an extent that there could be no profit whatever to the producer."

It has been suggested that unless a good price be asked it will not be secured. And there is more truth than poetry in that hint. Though, if the price asked be too high, there will also be less sales, and consequently less money obtained but more money left on the producer's hands. It seems to me that comb honey, in most home markets, should bring not less than 20 cents per single section, or six sections for \$1. Extracted honey should retail, per single pound, at 15 cents, or eight pounds for \$1. These prices certainly are not high, and yet large enough to sufficiently reward any reasonable producer in a fair honey season.

I am sure that the home market for honey has unreamed-of possibilities for successful development, and the wide-awake, progressive twentieth century honey-producer will find in it a veritable gold mine in exchange for his pure, golden honey—nectar fit for the gods, and hungry humanity's best food and medicine."

Ants in Apiary.

A. E. Manum, Bristol Co., Vt., thinks the trouble from ants in the apiary exaggerated. He says: "The large black and small red ants seem to take possession of double-walled hives for the purpose of rearing their brood, this being a favorable nesting place for them on account of the warmth generated by the bees. I find them in great numbers inside my outer cases, but rarely ever see one of either variety inside the brood chamber, except when I remove the honey board to examine the bees. The ants then being disturbed seem to run wild in all directions and occasionally they will run in among the bees; in which case the large black ants are soon

expelled by the bees, but the small red ants are not so readily disposed of, as they will bite and cling to the bees so tenaciously as to cause the bees much annoyance for a short time, or until the ants are driven away. In order to avoid the annoyance I lay pieces of common tarred paper inside the outer case; this has proved effectual."

Italian vs. Common Bees.

The veteran Prof. A. J. Cook thus summarizes the advantages of Italian over common bees: They possess longer tongues, and are thus enabled to secure stores where and when the blacks are helpless. They are more active and collect more honey. They work earlier and later, both in regard to the day and the season. They better protect their hives from robbers. They are almost proof against the bee-moth. The queens are more prolific. They are less apt to breed in winter, when bees should be kept as quiet as possible. The queen is more easily found. They are more disposed to adhere to the comb while being handled. They are less liable to rob other colonies. They are far more amiable, therefore much pleasanter to work with. This feature alone makes them particularly desirable for the amateur.

"The Little Busy Bee."

We often speak of the wonderful and admirable industry of the honey-bee without thinking of the amount of labor which that industry really represents, says the Youth's Companion. Careful experiments have shown that a red clover blossom contains on an average less than one-eighth of a grain of sugar. There being 7,000 grains in a pound, the bee that makes a pound of honey must obtain its material from no less than 56,000 clover-holds.

But this is not the whole story. In order to get the nectar, the bee is compelled to insert its proboscis separately into each floret, or flower-tube, composing the head of clover, and there are about 60 florets in every head. The insect must, therefore, perform this operation 60 times 56,000, or 3,360,000 times in order to obtain a pound of nectar.

Irrigation by Pumps.

The Nebraska Station's report says: "Irrigation by pumping from wells has not yet been practiced to any great extent in Nebraska. It is almost certain, however, that within the next few years nearly every farmer in the western and middle part of the State, where conditions are at all favorable, will have from two to 15 acres under irrigation by this method."

New Use for Cornstalks.

Our naval constructors continue to grow into the idea that the pith of cornstalks is a better protection for the hulls of war vessels than the cocoa cellulose, upon which the French build great expectations. Both fire and water tests support this view. As to the former tests, the cocoa fiber was made to flame by an ignition which only blackened a little the cornstalk pith. Again, streams of water were directed from a hose against the holes made in the two cofferdams by last week's firings. The hole of the six-inch shot in the cocoa washed out in half a minute to a depth of a foot and a half, and that of the cornstalk to a depth less by four

inches, the material of the latter being also harder and firmer. Very powerful streams were then directed upon the eight-inch shot holes, and the cocoa cofferdam was bored through in nine seconds, while the other took twice as long.

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THE GARDEN.

Puckings.

When light summer rains fall, the land should be cultivated, for if this is not done the moisture soon evaporates and is lost.

The most perfect of the famous Colorado potatoes have been grown after alfalfa, and a rotation including it is being rapidly adopted in that potato country.

Whenever the country becomes agitated by the discovery of some new weed, this truth should be considered: that weeds do little injury to good farms, and that good farming exterminates weeds.

Blackberries and raspberries may be grown quite as well in the partial shade between orchard trees as if fully exposed to the sun. Successful double cropping should, however, be accompanied by double applications of plant food, otherwise the trees or the berries will be starved.

The greatest difficulty in the growing of late peas has been the aptness of the plants to mildew. This is doubtless on account of the heat of the time, by which the growth of the mildew is so much encouraged. But by spraying the peas the mildew germs are destroyed, and this excellent vegetable may be grown until the last of the season.

The time for pruning all kinds of flowering shrubbery is immediately after the blooming, then the new growth of all is improved, while if the pruning is done early in the Spring those shrubs that bear their flowers on the last year's growth are destroyed, but those which bloom on the Spring growth are uninjured. Spring pruning, however, is safe for any one or all.

It will be found an easy remedy against the pestilent cabbage worms to sprinkle some cheap flour on the hearts of the plants where the worms love to do their mischief. They get stuck in this adhesive matter, especially if it is a little damp with the dew, and are unable to untangle themselves. Rye flour is cheap and as effective as any other. It should be done in the afternoon, so that the dampness of evening will make it most effective. This device is applicable to other cases.

Rotation in crops does not apply to strawberries or most of the garden plants. For instance, the asparagus bed, once well planted, will remain in its full bearing condition 20 or twice as many years, if it is only reasonably well fertilized. So with the currant and the gooseberry bushes, and so it may be with the small fruits that reproduce themselves annually by runners or suckers. But one thing is needful—namely, to feed adequately of whatever the special necessities of the plant require, to prevent weeds, and to keep the soil well tilled.

Club Root Cabbage.

B. D. Halsted, of the New Jersey Station, has been experimenting on preventives of this disease, and arrives at the following conclusions:

"Air-slacked stone lime is a preventive of the club root of cabbage. The best results were obtained from the smallest application—that is, at the rate of 75 bushels per acre.

"Gas lime, kainit, and wood ashes are all equally ineffective as club root fungicides.

"A half-strength solution of corrosive sublimate at the rate of 2,160 gallons per acre cannot be recommended; for although an apparent preventive of club root, the solution is destructive to the plants. A weaker solution might prove just as effective as a fungicide without interfering with growth.

"Neither half-strength bordeaux mixture nor ammoniacal copper carbonate, when used at the above rate, diminished the amount of clubbing and both were very injurious to the plants."

Early and Late Planted Potatoes.

L. E. Jones, of the Vermont Station, calls attention to the greater liability to disease of late planted potatoes. Ordinarily the early crop of potatoes is less productive than the later, owing to the fact of the tubers usually maturing in July, the driest month of the year, but in 1894 the season was so peculiar that the early crop was the most productive. It is believed that for the average season late planting is the most profitable, in spite of the fact that the plants must be sprayed to protect them against the late blight.

The author advises the use of clean seed, planting in clean soil, and the use of clean fertilizers. Where the seed potatoes are not known to be free from the scab it is suggested that they be soaked in a solution of corrosive sublimate before planting. After such a treatment the yield of merchantable potatoes in one of the author's experiments increased more than 50 per cent. in 1894.

Potatoes.

The Maryland Experiment Station finds that when crimson clover is plowed under as a green manure early in May the yield increased by more than 19 bushels per acre. Spraying with bordeaux mixture afforded a larger yield than the untreated plot, and when spraying was begun early the yield was further increased. Distances of 14 1/2 to 30 inches afforded a larger yield than distances of 12 by 36 inches. Deep cultivation, ridge culture, and cultivation continued late in the season proved slightly advantageous. Small whole seed potatoes afforded a larger profit than large whole potatoes and cuttings.

Rotation.

Good farming involves rotation. Seed-producing crops must be alternated with nitrogen-producers.

One kind of crop will kill out one kind of weeds and another another kind.

The same with insects and crop diseases.

SWEET POTATOES.

The Secret of Success in Raising Them on the Eastern Shore.

For many years now the sweet potatoes from the Eastern Shore of Maryland have been famous, and the farmers who have raised them have found good profits in the industry. Nearly all of the land adapted to the potato is taken up, and the output has reached almost its limits. The question of what makes the Eastern Shore potatoes do so well, and have a superior quality, has been asked by many intelligent observers. The farmers do not give much information other than they plant the seed, cultivate the vines, and the soil does the rest. The soil is not so very different from that in many other parts of the South, and the cause cannot be in that.

But a feature of the farmers' work may throw some light on the subject. Years ago pine shatters were spread upon the soil to fertilize it, and to-day this forms the chief manure for the vines. The pine shatters supply plenty of carbonaceous matter to the soil, and therein is the great secret of the success of potato-growing here. Other improvements of the soil are not made, and cultivation is not superior to that given to potatoes elsewhere. In fact, on many small farms the potatoes are neglected, compared with the cultivation that many progressive Jersey farmers give to this crop.

The farmers gather last year's droppings of pine shatters, and cart them to the barnyard late in Summer. These are spread about a foot thick in some convenient place, and then covered with two or three inches of dirt. Then another layer of shatters is made, and another of soil. All through the Fall and early Winter the pine shatters in the bed rot and decompose, and by Christmas time they are so far gone that they will readily mix up with the soil. The shatters decompose without losing any of the elements of fertilization. The woody material mixes with the layers of soil, and by midwinter this mixture makes a perfect manure. When placed upon the potato field the farmer has almost a perfect fertilizer for his potatoes, and at no cost. The farmer is composting his manure every year, and nature is supplying new material for him with each year's crop of pine shatters. The same process to a certain extent could be obtained from buried forest leaves in the North, although the pine shatters may give more carbonaceous matter. They are eminently fitted by nature for this purpose.

This really is the secret of potato culture on the Eastern Shore.—*German-town Telegraph.*

Beans, and Where They Come From.

Until within the last few years we have been calling upon Austria and other European countries to help supply our enormous demand for beans. While last year the imports amounted in value to \$3,000,000, this year Europe has called for beans from America, and large consignments have been sent over.

New York and Michigan are States in which the culture of beans is carried on to the largest extent, Michigan ranking first. In the city of Grand Rapids one firm handles more beans yearly than any other concern in the world. Between 700 and 800 car-loads—a car-load being about 530 bushels—pass through their elevator annually.

Many beans come to us from Canada, the Canadian bean ranking well with those of Michigan and New York.

Canada and New York supply most of the beans for the Eastern market, Michigan seldom shipping further East than Buffalo, or further West than Topeka, as beyond these points there is competition with California, the matter of freight being an important consideration.

While it is generally supposed that Boston consumes more beans than any other city, New Orleans has proved a formidable rival, demanding about 200 car-loads annually. The miners of Pittsburgh and the surrounding country consume many beans. Duluth, Minneapolis, St. Paul, and other Northern lumbering towns buy many car-loads to supply the lumbermen. The Southern cities are not far behind, with the demand yearly increasing. Beans are the same flavor to the world over. While the American beans are very uniform in size, the sizes of European beans vary to such an extent as to make it necessary to sort them two or three times before they are put upon the market. Uniformity of size is very important, as much depends upon it for success in cooking.

While beans will grow on any land that will produce wheat, much experience and skill are essential for their successful cultivation.

The yield is about the same as that of wheat, from 12 to 30 bushels to the acre, but the returns are much larger, being, with wheat at 50 cents, nearly three times better.

How to Use Nitrate of Soda.

This fertilizer is very quickly soluble and thus acts immediately, being taken in by the roots in a few hours after it is applied to the land. Hence it should only be used when the crop to which it is applied is in a quickly growing condition. Thus, it is a waste to use it in the latter part of the season, and the best time is in the Spring or Summer soon after the crop is well started in growth. It is advisable to divide the quantity, sowing half of it later and when the plants are in an active condition. For onions, it should be sown in three portions, the first when the seed or the sets are put into the ground, the second two weeks later, and the third two weeks after the second, thus preventing any loss of the nitrate in the soil by washing into the subsoil before the plants can dispose of it.

The Field.

Not hard work, but poor care, destroys the average farm horse.

English farmers are finding that they can grow alfalfa to advantage.

Rape will produce 10 tons of green forage on an acre of good land.

Rape has twice the feeding value of green clover, and is even more palatable.

Lean sheep may be turned into a field of rape, and taken out fat two months later.

F. T. Tracy, of Stacyville, Me., who raises 60 acres of potatoes each year, uses 1,500 pounds of phosphate to the acre.

Prof. Roberts computes that there is a loss of from 48 to 54 per cent. in value of manure that is left exposed to the weather.

A good deal of money is being made by breeding Shetland ponies. They cost about as much to raise to three years as a steer, and sell for from twice to thrice as much.

Permanent pasture, if it is to be made the most of for grazing purposes, should never be mown. Mowing encourages the stronger-growing grasses, makes the pasture much coarser, and destroys that fine bottom herbage of grasses and clover, which is an essential characteristic of all good pastures.

Study how to tend and shape the hoofs of the colt, and endeavor to know enough concerning the horse's foot and its care to keep out of the hands of the bungling blacksmith. A fine, spirited horse may have a bungling gait or a lack of endurance from bad feet, which will hurt its value very materially, and too often it is all the owner's fault.

The cultivation of corn should not stop until it is impossible to get through the rows easily, and at the last working it will be a good use of the money to sow 50 cents' worth of white turnip seed to the acre, immediately after the cultivation, and on the soft, mellow soil. It will be another good investment to sow 50 pounds of corn fertilizer to the acre at the same time.

The good effect of stirring the soil about the corn plants is unquestioned and unquestionable. That soil made loose and open on the surface absorbs moisture to a considerable extent is also unquestioned, and as this is useful to crops, it follows that the good farmer will not neglect to do this work as long as it is possible to be done. It has been found by many careful experiments that the yield of corn is increased to a much greater extent than the cost of the work, which really costs nothing if done at times when otherwise the man and team might be idle, but allowing the hiring price for both.

Permanency of Rye Grass.

The permanency of rye grass has been earnestly discussed in Great Britain for 50 years. Upon this fact depended its value for permanent pastures. One party contended that the grass would certainly die out in three years, another extended the period to six, and so on, all writers admitting that the plant died out by its rapid growth exhausting the soil of its natural food. The Aberdeenshire Agricultural Research Association has been investigating the matter for nine years, and has come to the conclusion that even on poor soil rye grass does not really die so soon, but adapts itself to the defective conditions and assumes a form so different in appearance from rye as not to be recognized as that grass. Furthermore, it now appears—and this is the point of practical importance—that rye grass may not only be kept in its well-known and valuable form, but that having assumed the degenerated form, it may be brought back to the original condition. At the present moment only one link in the chain of evidence is wanting; i. e., while leaves closely agreeing with true rye grass leaves have been produced from the degenerated form, the flower has not yet been produced—at least with certainty. It may, however, take some years before this point can be reached, and in the meantime the actual results got, and the observations that have been made, are stated, reserving freedom from commitment to any final conclusion.

Curing Oats and Peas.

This mixed crop is cured as hay is, being cut by the scythe or the mower or reaper in the usual manner. It is dried as hay is, and as it will not keep well in stacks unless these are well covered, it is best to carry the fodder at once to the barn. As there will be a waste in feeding it with the grain, when it has been ripened, it will be better to thrash out the grain and grind it, and feed it with the cut fodder. The green fodder cut before the grain is ripe is all eaten without waste, and is excellent for cows in the winter. It is not a good crop for the silo, as it tangles together so much, and must be cut down to get it out easily.

Oats.

The Oklahoma Station finds that with the Jensen hot-water treatment for smut the yield was increased 1.41 bushels per acre. When the seed bed was rolled twice the yield was slightly reduced. Broadcasting afforded a smaller yield than did the press drill. Subsoiling reduced the yield on alkali land. Fifty varieties, of which the seed was grown in Oklahoma or farther south, averaged 13.8 bushels per acre; 34 varieties from the States farther north 12.4 bushels. The variety Lincoln is recommended. Deep Fall plowing gave a larger yield than deep Spring plowing or shallow Fall plowing.

It has been found that the cucumber has a temperature one degree below that of the surrounding atmosphere. The expression "Cool as a cucumber" is, therefore, scientifically correct.

Results of Corn Experiments by the Illinois Station.

The test of varieties occupied 84 fortieth-acre plots. Mixtures of 2 and 4 varieties gave larger yields in 1894 than single varieties, though mixtures did not afford the larger yield every year. The height of stalks and size of ears increased with lateness of maturity. Of 13 varieties tested during five years Boone County White gave the largest yield, 71.5 bushels per acre, followed by Burr White, 61.9 bushels, and Learning, 60.7 bushels per acre. The medium maturing varieties averaged for seven years 65.2 bushels, the late varieties 58.8 bushels, and the early varieties 55.5 bushels; the yellow varieties averaged for seven years 60.3 bushels per acre, and the white varieties 63.2 bushels.

Burr White was planted at intervals of a week from April 6 to June 22; the average yield for seven years was greater from planting from May 11 to May 18. The variation was slight for the dates between April 27 and May 25.

In 1894, 2, 3, 4, and 5 kernels were planted in hills 3 feet 8 inches apart each way; the yield from planting 2 kernels was 40.2, 3 kernels 46, 4 kernels 49, and 5 kernels 48 bushels per acre. In another field with 3 kernels per hill the yield was 44.6, and with 4 kernels 50.5 bushels per acre.

Corn grown in rotation with oats and clover yielded 40 per cent. more than corn in continuous culture.

From cross-fertilized plants seed was selected in 1892 and again in 1893, the latter, together with both parent varieties, being used for the crop of 1894. The average increase in yield in 1894 from the cross-fertilized seed was 12 bushels per acre.

The tassels were removed from stalks on alternate rows; on the detasseled rows the yield was 56.5 bushels, and on those not detasseled 50 bushels per acre. The increase in yield was greater where the tassels were removed early than where they were removed later. Contradictory results secured in previous years and at other stations are briefly noted. "If an increase in grain is secured by detasseling, it is most likely to be on poor soil or in dry seasons. It seems that the injury done the plants sometimes reduces the yield."

Detasseled Corn.

For four seasons the Cornell Experiment Station has practiced detasseling corn, with the following results:

In 1890 a gain in total yield of corn of 50.6 per cent.

In 1891 a very slight gain.

In 1892 a gain in total yield of corn of 21 per cent.

In 1893 a gain in total yield of corn of 19.3 per cent.

Also the results of the experiments at the Nebraska Experiment Station:

1. The detasseling of corn seems to be a positive detriment and loss, as shown by the results in two years' trial. This is not conclusive evidence, but strongly indicative of what we may expect from the practice.

2. The expense is about \$1.25 per acre, and would require an increase yield from three to five bushels of corn to pay for the labor involved, this depending on the price of corn in any given locality.

3. Although the results of experiments in 1892 are strongly contrasted and so widely divergent, yet we do not deem them decisive. We propose to repeat the experiment on still larger areas and with different varieties of corn and note the results before we announce the positive rule that "detasseling does not pay."

Tobacco.

It has been demonstrated that the tobacco leaf takes fertilizers from the soil worth one cent for every pound of leaf, and the same value is taken in the stem and stalks for every pound of leaf, making the total loss of fertility in the soil equivalent to as much fertilizer as would cost two cents a pound of the crop. This shows that when the low qualities of leaf bring the grower only two cents a pound it does not pay for the fertilizer needed to give back to the soil what the crop has taken from it, not counting the cost of the labor.

The Paris green method is coming rapidly to the front for the tedious and disagreeable "worming." The green is mixed with common lead plaster at the rate of a tablespoonful of the poison to a couple of gallons of plaster. This is dusted upon the plants while they are wet with dew. Some use the green with water, the same as for potato bugs, only making the mixture slightly weaker. Poison should not be used late in the season.

A Cheap Silo.

A silo that will hold 150 tons of fodder, which is enough for 30 cows for six months' feeding, may be made for \$50; or the small cost of 35 cents a ton for the feed. It is very certain that the silo will be easily paid for the first year. And as cattle will be cheap in consequence of the short feed, the forehand farmer who is provided with a silo, and a crop of corn in it, may make something by buying some good cattle that must be sold for want of subsistence for them.

Wheat in England.

English buyers make important differences in price for wheat from different countries. This is shown by the following quotations from the *Mark Lane Mail* of June 10. The figures mean shillings (24 cents):

WHEAT.	Per 504 lbs.
English White.....	25 30
Red.....	25 30
FOREIGN WHEAT.	Per 480 lbs.
Saxons.....	23 20
Taganrog, Hard.....	21 25
Odessa, Hard.....	24 25
River Plate.....	24 25
Melbourne.....	23 25
New Zealand.....	23 25
California and Oregon.....	23 25
American No. 2 Hard Winter, New.....	23 25
Duluth and Hard Spring.....	23 25
India, Calcutta, Bombay, and Karachi.....	23 25
Foreign Gulf.....	23 25

NO MORE SEED DIVISION.

Secretary Morton Abolishes a Branch of His Department.

It is pretty definitely understood that the Seed Division of the Agricultural Department will close its doors after October next. Some time ago Secretary Morton submitted to the Attorney-General the question of whether or not he had the right under the law to abolish this work, which he conceived to be useless. The Attorney-General has within a short time given the Secretary an opinion, in which he declares that the Secretary has that authority, and, acting upon this decision, the Secretary has, it is stated, communicated to M. E. Fagin, the Chief of the Division, the official information that there will be no further need of his services and his clerks after October 1.

Mr. Fagin has, it is understood, tendered his resignation to the Secretary, and has taken occasion to congratulate him upon this step, which, Mr. Fagin says in his letter, was recommended by him in his first annual report.

This action of the Secretary will throw out of employment 10 people, besides the Chief, at present, and will result in the depriving of fully 150 more of occupation during the busy season—the winter months—when it is customary to send out the bulk of the seeds. The Chief has a salary of \$2,000 a year. There are two clerks at \$1,300 and eight at \$840. The extra force employed in the winter season is paid at the rate of \$1.50 per day. It is probable that Mr. Fagin will be appointed to another branch of the service after his resignation as Chief of the Seed Division takes effect.

The Attorney-General in his opinion said that under the law the Secretary had the right to discontinue the distribution of all but rare and unusual seeds, but that he could advise for bids and seeds and that he could also reserve the right to reject any or all bids.

The Secretary advertised for bids and rejected them all on the ground that they were not for rare seeds.

SECRETARY MORTON'S REPORT.

The Chief of the Agricultural Department Shows a General Pruning of Expenses.

The annual reports of the several Bureau offices of the Agricultural Department for the fiscal year just ended will show a general pruning of expenses. The figures in Secretary Morton's report will show that the regular expenditures for the Department during the year aggregated about \$1,800,000. The appropriations for the same period reached \$2,500,000. There will, therefore, be covered back into the Treasury about \$500,000. Last year \$627,115 was covered back into the Treasury. The exact figures for that year are \$2,693,500 appropriated, \$1,976,385 expended.

The total amount covered back into the Treasury from the appropriations made for the work since the beginning of the Administration aggregates \$1,300,000. This fact will be pointed out in Secretary Morton's report. Another fact to which attention will be called in the forthcoming reports is that with a few exceptions all offices in the Department are now comprised in the classified service. These exceptions include the Secretary, Assistant Secretary, their private secretaries and several laborers.

Several important changes in work and organization are noted in connection with the close of the fiscal year. Two Divisions, one of Agronomy and the other of Agricultural Soils, have been created and now go into effect. Professor Lawson-Scribner is Chief of the former and Professor Milton Whitney is at the head of the other. A Dairying Division has been created and goes into operation as a part of the Bureau of Animal Industry, and the rearrangement of the system of gathering crop statistics also takes effect. The new regulations of the Bureau of Animal Industry take effect immediately.

All special investigations carried on last year will be continued through this year.

WILDCAT CROP REPORTS.

Assistant Secretary Dabney Denies That the Agricultural Department Gives Tips.

Assistant Secretary Dabney, of the Agricultural Department, when asked concerning the statement of a broker that he had been given approximately accurate information on the other side of the crop report, said: "It is the same old story that is misused every once in a while. We deny it absolutely. If these reputable brokers in New York say those figures came from Washington let them prove it."

The truth is that there are plenty of other people outside of this Department who are engaged in the work of preparing statistics of the crops in the interests of the exchanges. They sell their information. For example, there are a number of people, formerly in this office, who are now engaged in making up crop reports for the exchanges. They have correspondents all over the country, doubtless, in many cases, the same correspondents that the Department has. When they left here they undoubtedly had lists of our correspondents and have presumably made use of them since, although we have endeavored to change our correspondents as far as possible since then. Still, the crops are the same whoever reports them, and their reports might reasonably be expected to be as accurate as ours. If a man has a set of figures it is money in his pocket, and that they emanated from the Department of Agriculture. The truth is that they don't, and that is all there is about it."

ZINC ONLY AN EXCUSE.

Germany's War on American Dried Fruits Fails to Conceal Its Motive.

The stringent regulations of Germany regarding the importation into that country of American products have been brought to the attention of the Agricultural Department by a report by European Agent John Matthes, Jr., on American evaporated or dried fruits in the German Empire. Shippers of these fruits are given warning of the severe restrictions imposed by Germany, which the report views as commercial rather than hygienic, and merely intended to shut out American trade.

The report cites a recent court trial at Frankfurt-on-the-Main, to determine whether these dried apples, or rings of apples, were impure and injurious to public health and subject to seizure under the provisions of the Pure Food Law. Government experts testified that they were sprinkled with a tinge of acetate of zinc to give them a bright color and more inviting appearance. Apples so sprinkled, they claimed, brought on indigestion. The American goods were ordered destroyed as unwholesome.

Exporters are advised that if they wish to increase the trade with Germany, now assuming large proportions, they should be careful not to dry the fruit on zinc grates, but to use grates made of cane. The Department says they are confident that if any zinc is introduced in the fruits the amount is infinitesimal and cannot be injurious.

To Stop Concassation of American Apples.

Consul Robertson, at Hamburg, acting on instruction from the State Department, has obtained permission from the Chief of the Hamburg Foreign Office to procure samples and an analysis of any American dried apples which may in the future be confiscated on the ground that they are alleged to contain zinc. This action is taken with a view of stopping the concassation of American apples by German authorities.

Stop Naturally!

Don't tobacco spit and smoke your life away, and go on suffering from nerve troubles that make the strongest man weak, dizzy and undecided, prevent him from doing the right thing at the right time, all because the blood is tobacco poisoned. The natural way to stop a thing is to get a taste for it. You can stop naturally this brain-weakening, nerve-ruining, tobacco disease by the use of the original, time tested, guaranteed tobacco habit cure.

NO-TO-BAG KILLS TOBACCO

You ask for proof? Test No-To-Bag under our absolute guarantee. One box of No-To-Bag kills the desire for tobacco, eliminates the nicotine, steadies the nerves, increases weight, restores the rich, tingling taut life and energy. Sixteen days will be gone! The sunshine will be brighter. The world is feeling its new young again and happy.

OUR GUARANTEE

TO PLEASE AND TO THE POINT. One box of No-To-Bag kills the desire for tobacco, eliminates the nicotine, steadies the nerves, increases weight, restores the rich, tingling taut life and energy. Sixteen days will be gone! The sunshine will be brighter. The world is feeling its new young again and happy.

Stocks: "Hart Tobacco and Smoke Pipe Life Away," mailed free. Beware of imitations: there is no substitute for NO-TO-BAG. STRAHLING, 100 Broadway, N. Y. City. R. Service Co., 245 Broadway, N. Y. City. Canada office, 24 St. Paul St., Montreal. Laboratory, Indiana National Springs, Ind.

Disease Among Poultry.

Experts of the Agricultural Department have been carrying on an exhaustive investigation of infectious diseases among poultry. The prevalence of protozoa among turkeys was the subject of a special inquiry. The results show that the disease attacks the young by preference, and that infection does not take place till later on. It runs no regular course, but varies in severity, duration and termination. Though restricted to the cases and the liver, its action is severe enough to prove fatal to many affected turkeys. The disease process is always associated with a protozoan parasite of very minute size. Certain flocks only are affected and the disease becomes perpetuated and diffused among neighboring flocks. The remedy recommended by the Department is to entirely destroy the diseased flocks and obtain new animals elsewhere, after a thorough cleansing and disinfection of the territory occupied by the diseased fowls.

The Exhibition at Denver.

Intended exhibitors of fruit, grain and agricultural products at the International Mining and Industrial Exposition, to be held in Denver next year, are reminded that the greater part of the exhibit must come from this year's crops, as the Exposition opens on July 1. An especial feature is to be made of agricultural and horticultural products at this Exposition, and exhibits are being sought from every state and territory west of the Mississippi River. It is expected that the irrigation feature will prove especially valuable, as for the first time in the history of the United States the great science of irrigation will be exemplified upon a scale commensurate with its growing importance. It will be a prominent educational feature of the Exposition. A large portion of ground will be used exclusively for the purpose of showing all irrigation processes and the various instruments for recording the volume of water in irrigation canals and rivers. The evolution of irrigation will be demonstrated from the most ancient to the most modern systems. It will naturally attract many collateral displays, such as engines, pumps, wind-mills and other irrigation appliances. Many varieties of fruit trees, grains and grasses, vegetables, melons and vines will be grown, including the hop, tobacco, cotton, cannae and other growths which constitute the basis of large manufacturing interests. As no two crops require the same amount of water, and each one is irrigated independently of the other, the crop reports of the same season, this interesting process will be shown in all its important features.

Arizona, Colorado, California, Idaho, Wyoming, New Mexico, Nevada, Utah, Washington, Montana, and Oregon are expected to make valuable displays of agricultural crops grown by irrigation.

An Agricultural Congress.

The Belgian Minister has informed the State Department that the third International Congress of Agriculture will be held at Brussels from September 8 to 16. The Belgian Government has expressed a wish that the United States be officially represented at the Congress.

FAIRS.

The Great Inter-State Fair of the Bethlehem Fair and Driving Park Association will be held at Bethlehem, Pa., Sept. 17-20, 1895. Secretary, H. A. Gromann, Room 8, P. O. Building.

Patrons' Encampment and Exhibition of the Pennsylvania State Grange will be held at Center Hall, Center County, Pa., week of Sept. 16, 1895. Secretary, R. H. Thomas, Mechanicsburg, Pa.

Annual Fair of the Western Pennsylvania Agricultural Association will be held at Washington, Pa., Aug. 27-30, 1895. Secretary, Julius L. Moyle.

A Midwinter Exhibit of the Agricultural and Poultry Society of Mifflin County, Pa., will be held at Lewistown, Pa., Dec. 10-13, 1895. Secretary, A. T. Hamilton.

Sixth Annual Meeting of the Mt. Gretna Agricultural, Mechanical and Industrial Exposition will be held Aug. 19-24, 1895, at Mt. Gretna, Lebanon County, Pa. Secretary, S. P. Heilmann, M. D., Heilmann Dale, Lebanon County, Pa.

Annual Fair of the Harford Agricultural Society will be held at Harford, Pa., Sept. 25, 26, 1895. Secretary, E. E. Jones.

The Second Annual Fair of the Kittanning Fair Association will be held Aug. 30-23, 1895. Secretary, T. McConnell.

The annual fair of the Mille Lacs County Agricultural Society will be held at Princeton, Minn., Sept. 4-6, 1895. Secretary, J. W. Hartman.

The Second Annual Exhibition of the Buckeye Poultry Association will be held at Dayton, O., Dec. 26-31, 1895. Secretary, C. H. Clark.

The First Annual Exhibit of the Whitman County Fruit and Agricultural Society will be held at Colfax, Washington, Sept. 24-28, 1895. Secretary, Zell M. Beebe.

The first hay press ever in Quitman County, Miss., was set up there a few days ago. This seems an odd thing in one of the oldest agricultural regions of the country, but the explanation is in the fact that hitherto the land thereabouts, as in many other regions of the South, has always been devoted solely to the growing of cotton.

Permanent Meadows.

Strong soils, whilst they are frequently not the best for cropping purposes, can in most cases be converted into excellent pasture. This is largely due to the fact that such soils are greatly improved when under



SAID TOM, "I'll never speak to him again; he is too contemptible to be even thought about."

Such were the bitter words of one who had been grievously wronged. Tom Allen and Joe Dunbar had been friends and comrades from childhood. In the early days of the settlement of Michigan their fathers had removed with their families from Massachusetts, to what was then called the "Far West," and settling on neighboring farms enjoyed the pleasant social intercourse which was somewhat restricted by distance from other neighbors in the then sparsely settled country. Living only half a mile apart, the boys had attended the same school, sat together there, played the same boyish games, until, when they had grown to young manhood, they had spent many a day with their rifles in that most fascinating of all pursuits to the pioneer settler, the chase after wild game of various kinds; so that both had become quite expert in the use of the rifle. They roamed the forests fearlessly, and many a Winter's evening, as they clustered around the great crackling fires of beech and hickory wood, eating nuts and apples, was enlivened with stories of hairbreadth escapes from the clutches of a panther or other wild beast with which at that time the dense woods were infested.

But often as the parents would recount the hardships and changes through which they had passed in clearing, fencing and bringing to a high state of cultivation their beautiful farms, there would sometimes creep into the conversation a tinge of regret that they were not again in the East, where educational advantages would be so much better for their sons. Tom and Joe were both good students, and had shown a marked ability in mastering the subjects they had thus far pursued, and, stimulated by their parents, were quite ambitious for a higher education. Again and again did the problem come up for solution in each family, how, with limited means, and needing his help on the farm, could the son be spared to be sent away to college, and as often had it remained unsolved.

One lovely afternoon in September, as Mr. Allen stood at his gate looking out over his farm, his view taking in the long stretch of cornfields whose long blades gently stirred by the breeze were glistening in the sunshine, and farther on the young orchards laden with rosy apples, which seemed blushing at their own beauty and abundance, a neighbor passing by on his return from the town of C—, 10 miles away, seeing him, drew up his horse and said:

"Have you heard that our Member of Congress from this District has notified Prof. Thomas of Storrs High School, that he has the privilege of recommending for examination a cadet for West Point? I heard say, too, that your son and neighbor Dunbar were two of the most likely lads in these parts, and that the last two Winters had gone to his school they were so evenly matched that he thought that about the best way to decide between them would be by shooting at a mark, as a soldier ought to be a good shot, of course."

Mr. Allen, expressing his surprise, quietly said: "That would be a close contest, for they are both good marksmen"; thinking at the same time that the news might not be quite correct; nevertheless, after a little longer talk on the subject and a few final words concerning the weather and the crops, after saying "good-by" to his friendly neighbor, he hastened into the house to talk over the news with his wife.

"It would seem too good to be true," said Mrs. Allen, "if such a chance should fall to Tom; yet, if Joe should be the fortunate one, why, we might, I think, unselfishly rejoice with the Dunbars."

Tom and his sister Lucy were greatly excited when the story was told to them, but they decided to keep quiet about it till they knew certainly that it was true. They could not help, however, discussing the possibilities and probabilities in regard to it, and it was not till long after midnight that Tom was able to close his eyes in sleep. The next day he could hardly wait till time for the mail, but set off an hour too soon for the post-office, where he impatiently paced back and forth before the door and several times decided that the mail must be late, though repeatedly assured to the contrary by the good-natured Postmaster.

In due time it came, and there, sure enough, was a letter for Tom and also one for his friend Joe, both postmarked C—. Tom nervously tore his open and found a kind note confirming the news of the day before from his old teacher. It was also arranged that on a certain day the next week the two boys should present themselves at the school grounds of the C— High School, and there would be decided by their cleverness in the use of the rifle the momentous question as to which of the two "best boys" in school should have the appointment for examination for the West Point cadetship. Tom carried Joe's letter to him as fast as his favorite pony could skim over the ground, and after reading it he was no longer and excited than Tom.

For the next few days there was little else thought of or talked about by those two families than the coming contest. Tom and Joe were constantly practicing with their guns, and the more they practiced the more anxious each became to win the coveted honor. The interest had extended all through the neighborhood, so that on the day appointed there was quite a crowd ready to attend them on their way to C—, and many a wise conjecture was indulged in as to which of the two would be the winner. Some who had never been known to distinguish themselves by fine scholarship at school, nor yet in games upon the playground, thought it would be rare fun to see the shooting match, but openly declared that they would not go to West Point or any sort of college if they could, thus proving that excellence without effort is seldom attained anywhere.

The morning had been cloudy and threatening rain, but at noon, when all were assembled on the playground, the sun broke through a rift in the clouds and came smiling down upon them. Prof. Thomas warmly greeted his old pupils, expressing most heartily the pleasure it gave him to be allowed to choose from among his pupils in conferring such an honor, and said:

"Boys, less than a hundred years have passed since this broad, free land of ours, stretching from the Great Lakes to the Gulf, and from ocean to ocean, was one unbroken plain, forest, and mountain slope, inhabited only by the red man, and proud as I am of our country and its institutions, I believe we owe it all under God's blessing to the dexterity with which our forefathers used their rifles. A young man who can distinguish himself in the use of firearms must have courage, pluck and endurance, qualities which, resting on a foundation of good Christian principles, cannot fail to make him a fine soldier; and if one of these young men standing here to-day could so build on that foundation as to reach in the years to come a place of eminence in our country, I am sure all Michigan would rejoice."

It was thought necessary to have some preliminary shooting in order to steady the nerves, in which several persons took part, and it was noticed how evenly the young men were matched. At last all was ready and the final contest began. Joe took his place and fired with such an unerring aim that a murmur of applause greeted the final shot, and the words "He will do well if he can beat that" were heard on all sides. But none knew so well as Joe Tom's ability, and it was with a feeling of dread that he took his place some little distance apart, but where he could distinctly see the result of each shot. He watched breathlessly, and soon he saw that two of Tom's shots had gone so near the mark that it only needed one more as good to give him the victory. Then for the first time in all those years of comradeship did Satan and the "green-eyed monster," jealousy, enter into his heart. "He shall not win if I can prevent it," he thought, and suddenly taking out of his pocket a small mirror he flashed the sunlight full in Tom's eyes just as with finger on the trigger Tom pulled for his final shot. But the blinding light caused him to miss his aim, and the shot fell wide of the mark.

All eyes being on the target, none saw what had happened except Tom's sister Lucy, who had a secret admiration for Joe, and whose gaze for the moment was turned upon him instead of her brother. Lucy stood dumb with astonishment while cheer after cheer rent the air for Joe Dunbar, and she saw in a dazed sort of way her brother among the first to go and give him hearty congratulations.

He determined, however, to banish all sad thoughts from his mind on such a lovely morning, and, so quickening his pace a little, while the soft air fanned his cheeks and the music of the birds seemed still sweeter, as came the thoughts, "The Lord God omnipotent reigneth; let all the earth rejoice. He will withhold no good thing from those who put their trust in Him," and he was glad once more as Nature's sights and sounds took on a newer and a higher meaning, and he "read books in the running brooks, sermons in stones, and good in everything." But, suddenly looking forward, he saw round a bend in the stream someone standing at the end of a large log which extended out some distance into the water, very busily fishing. Lifting his eyes to the tree whose long, graceful branches overhung the stream and the log on which the person was standing, he saw what, for the moment, transfixed him with horror; for there, only partly concealed by the leaves, was a huge panther creeping slowly and stealthily toward the spot where, as a nearer approach revealed the fact, stood his old friend and comrade, all unconscious of danger. Quick as thought he sped to seize the trunk of the tree, and cocking it aimed it directly at the heart of the animal. The click of the gun aroused Joe's attention, and turning around he discovered just behind and not many feet above, on the limb nearest him, the ferocious beast, with fiery eyes, distended

mentioned, and when, after a little delay, all were merrily chatting on their way homeward, Lucy bravely tried to conceal the emotions of indignation and sorrow ranking in her young heart. Her quiet, say-nothing demeanor was attributed by all to her disappointment on her brother's account. But when, in the seclusion of the family circle that evening, Lucy disclosed her secret, Tom's indignation knew no bounds, and he exclaimed in the words with which our story opens: "No, I'll never speak to him again; he is too contemptible to be even thought about."

"I know," he said, "how terribly bright the sunshine seemed just at that last shot, but I thought a cloud had suddenly passed, making the sunlight all the brighter. How unpeppably mean of him."

"I am very sorry," said his father, "and I would not have thought it of him."

"Never mind, Tom," said his mother; "I would rather have a son with good and noble principles at home, than have one at West Point without them."

A long talk ensued, during which it was decided that nothing further should be said upon the subject, and that the best and most dignified way for them to do would be to behave as if nothing had happened.

"The way of the transgressor is hard," said Mr. Allen. "No one would want Joe's accusing conscience to-night. To have obtained a prize, however valuable, by fraud would surely take away all joy in the possession of it, and I hope, my



IT FELL DEAD AT HIS FEET.

son, that you will never be tempted from the path of rectitude, no matter how great the reward may seem to be. I would rather have you go through life with limited education and small means, yet with the highest Christian principles, than have you attain to the Presidency of this great Nation with a scarred conscience or dishonored soul."

But little was seen of the Dunbars for a few days, and Joe would always appear to be in a hurry or going some place. Tom felt sure that all this restless activity was the result of an uneasy conscience, and though hurt and disappointed at the want of manly integrity in his friend, yet at times he almost pitied him.

One morning Tom had an errand at a neighbor's, some five miles distant, and as his pony had injured a foot in some way, he concluded to walk. In order to shorten the distance he took a path leading into the forest, where the tall oak and ash, the beech and stately pine grew thickly together, making a dense shade very grateful to the pedestrian on this warm September morning.

The birds twittered and sang among the leafy branches of the trees, and their songs, together with the murmuring of a little stream which gurgled and splashed along in its rocky bed near by the path along which Tom's route lay, made a sort of reposeful music to the soul of one alive to Nature's changing moods. Following the stream it became deeper, and here and there through its limpid waters could be seen the silvery trout darting up to the surface for a moment, then gliding so quickly away.

As he went on a troubled memory of the happy past momentarily came to him of the days when he and Joe, the best of friends, had hunted together in these wild woods and fished in these same waters; yes, the happy past, not irrevocably gone, and the old friend, not gone, but oh! so changed.

He determined, however, to banish all sad thoughts from his mind on such a lovely morning, and, so quickening his pace a little, while the soft air fanned his cheeks and the music of the birds seemed still sweeter, as came the thoughts, "The Lord God omnipotent reigneth; let all the earth rejoice. He will withhold no good thing from those who put their trust in Him," and he was glad once more as Nature's sights and sounds took on a newer and a higher meaning, and he "read books in the running brooks, sermons in stones, and good in everything." But, suddenly looking forward, he saw round a bend in the stream someone standing at the end of a large log which extended out some distance into the water, very busily fishing. Lifting his eyes to the tree whose long, graceful branches overhung the stream and the log on which the person was standing, he saw what, for the moment, transfixed him with horror; for there, only partly concealed by the leaves, was a huge panther creeping slowly and stealthily toward the spot where, as a nearer approach revealed the fact, stood his old friend and comrade, all unconscious of danger. Quick as thought he sped to seize the trunk of the tree, and cocking it aimed it directly at the heart of the animal. The click of the gun aroused Joe's attention, and turning around he discovered just behind and not many feet above, on the limb nearest him, the ferocious beast, with fiery eyes, distended

jaws and glistening teeth, with claws unsheathed and its tail, waving from side to side, crouched and ready to spring upon him.

Joe realized in that dreadful instant his utter helplessness and peril and gave vent to a most terrific shriek which echoed and re-echoed, through the forest like the wail of a lost soul. At the same instant the well-aimed bullet from his gun in Tom's hands entered the heart of the panther and it fell dead at his feet. Imagine his emotions when, the danger past, and recovering himself a little, he recognized in the person of his rescuer his injured friend, who, a few yards away, was standing, gun in hand, quietly awaiting him. The blood now mounted to his face colorless face, and rushing to his brave deliverer, the tears streaming from his eyes, he threw himself at his feet and cried out brokenly amidst his sobs:

"Oh! forgive me Tom; I have so wickedly wronged you. You have saved my life. I do not deserve to live; you should have shot me instead of the beast."

Tom, gently lifting him up, said: "Come, Joe, let us sit here on this log and talk it all over."

After his emotion had somewhat subsided, he fully confessed his fault, owning how miserable he had felt ever since; how he had almost hated himself for it, and yet had not the courage to undo the wrong.

"Now," said he, "that I have confessed all to you, Tom, I feel that I can ask God's forgiveness, and I shall pray, as never before in my life, 'Lead us not into temptation.' I will go at once to Prof. Thomas, explain all, and begging his pardon for my deception, ask him to send in your name instead of mine."

The last vestige of unkindly feeling was taken from Tom's heart as he listened to Joe's evidently painful and humiliating confession. He freely forgave him, and the two friends shook hands and parted. Joe was as good as his word, and did not stop until he had seen his teacher, acknowledged his fault, and given Tom the place he knew he deserved. Tom graduated at West Point, and in the years which followed took rank with the illustrious men of our Nation.

Joe Dunbar, profiting by his painful experience, became a thoroughly honest young man, and putting forth redoubled efforts to obtain a higher education, finally succeeded, and was never known during the course of a long and useful life to be other than a strictly upright, conscientious and honorable man.



[For the leisure hour of readers, old and young. All are invited to contribute original puzzles and send solutions to these puzzles. Answers and names of solvers to this issue will appear in two months. In order to avoid definition signifies that the word is obsolete. Address letters for this department: Puzzle Editor, THE AMERICAN FARMER, 129 New York Ave., Washington, D. C.]

ENUCLEATIONS.—NO 14.

107—K—look. 109—Bag—game.
108—DEL. 110—F. I.
RELATES. SEANS
MELTHERS. STARTED
DELIVERANCE. SUTHERS
DECLARATIONS. QUARTERSTAYES
LITERARY. INTERESTED
ARRATIONS. SEROTINES
SCORS. DEVERES
KNS. SE

111—A mother's death.
112—MISTAKEN. INTRACITION
TROTODONS. TROTODONS
SARALOTS. TROTODONS
SCOTS. TROTODONS
NIMS. TROTODONS
NOS. TROTODONS
113—My dreamland visit to Beulah Land.
—Trail allowed.
Authors of word-forms: Tunstie, Dan D. Lyon, Pallas.

ENIGMATAICS.

Complete Lists: None.
Incomplete: Malenco, Ben Trorato, G. Race, Alumnus, Polga, Pearl Glen, E. Lucy Date, Primrose, Harry, Serpeggiando, A. N. Drew, Jo Ural, Pearl, O'Boggan, Lillian Locke, Nyas, Christo, St. Julian, Arty Fishel, 2 E. Z. F. L. Smith, Guidon, Beech Nut, N. E. Body, Carl, Haidee, Anne Koe, Presto, Calo, Phil, Pansy, Ingleside, Rodger, Fanczy, Zoroaster, Clondre, Nedmac, Holly, Dan Knight, Locust, Cosette, Cecil, Cary, L. M. N. A. L. Vin, The American Farmer, N. E. Moore, K. T. Die, Ellsworth, Damon. Total, 52.

Prize Winners.
1. T. O'Boggan; 2. E. Lucy Date; 3. G. Race; 4. Ingleside.

ENIGMATA.—NO 16.

NO 129.—TRANSPPOSITION.
If I were a poet I might write
Her wonderful beauty in rhyme,
But my pen is so slow to write right,
And do it in metric time.

If I could her womanly grace place
On canvas as now it appears,
The contour of that delicate face trace—
But that would take several years!

Her eyes have a mystical bright light.
Had she lived in medieval days,
I'm sure there would many a knight fight
To bask in their radiant gaze.

I'll never a maiden more neat meet;
Complexion? Why, sir, it's sublime!
To kiss her were surely a sweet treat—
If she was not given to PRIME!

—L'ALLIANCE, Pittsburg, Pa.

NO 129.—SQUARE.

1. Town of Brazil, in Para. (Worc.)
2. Of an arm. 3. To confirm.
4. To admonish. 5. A mark engraved or stamped. (Encyc. Dict.) 6. Tasting. 7. Town of Bavaria, on the Regen. (Worc.)
8. Town of Hindostan, in the Candahar. (Worc.)
—T. HINKER, Bangor, Pa.

NO 134.—NUMERICAL.

Tho' some may little strength derive
From a mere trifle, 1 to 5,
It serves to keep their forms alive.
A maiden who is 6 to 2,
Is proof of her bright eyes of blue,
And of that hair of golden hue.

Her hands are often 6 to 10s
With something grown in shady glens,
From 5 to 1 the skin to cleanse.

An Old World warbler, which can claim
The total for its fruiting time,
Is known to every British dame.
—MAUDE, St. Joseph, Mo.

NO 125.—HALF-SQUARE.
1. A letter. 2. A Latin prefix. 3. Twitching. 4. A thickset. 5. A town of Spain. 6. Joyful music, as of song. 7. The Balkan Range. (Schmidt.) 8. Lads. (Stand.) 9. French hauberk and cuirass. 10. 1754. 11. A three-masted vessel. 12. Dutch Grammarian; 16th Century. 13. Stops. 13. Recklessness. (M. & S.)
—FALLAS, Pawtucket, R. I.

NO 126.—TRANSPPOSITION.
Slowly,
Lowly,
Sinks the sun.
Day is done,
Night's begun,
And the sentinels on high
Take their places in the sky.

O'er logs
Dank fogs
Are rising slow,
And to and fro
Their strange forms blow,
Like ghostly demons at the night
Deifying the passing light.

The moon
Will soon
Glow white and clear;
While far and near
Fall on the ear
Night's last weird voices holding sway
Till silenced by the light of day.
—DAN KNIGHT, Philadelphia, Pa.

NO 127.—DIAMOND.

1. A letter. 2. To turn public matters to private advantage. 3. Ravages. 4. Disown. 5. A man without property or influence. 6. An American plant of the lily family with yellow flowers. (Stand.) 7. Benthamism. (Stand.) 8. Marine univalve mollusks of the genus Strombus and allied genera. 9. Plants of the genus Zizyphus. 10. A certain measure of weight. 11. A letter.
—E. W., Boston, Mass.

NO 128.—TRANSPPOSITION.

A rose spread wide its petals sweet,
Because a flower at sight,
That made of earth an Eden fair,
A bloom of beauty bright.

A little child, with hand upraised,
Grasped at the fragrant flower,
Then, with a cry of anguish pained,
Dropped it within the bower.

But the aching sting was left behind,
The pain for pleasure given,
The little heart untraced to him,
With grief was sorely given.

Do we grasp at pleasure? How oft the thorn
Of disappointment stings,
And what we thought was perfect bliss
A world of trouble brings.

Contentment, patience, faith, and trust,
Sweet TOTAL 'e'er for pleasure,
Give us alone the rule quite OKE
For joy in fullest measure.
—FRANKY, Binghamton, N. Y.

NO 129.—DIAMOND.

1. A letter. 2. Dispensation. 3. Tributes. 4. Forms into roundness. (Encyc. Dict.) 5. An instrument for intensifying sounds produced by percussion of the thorax. 6. The part of the scapula above the spine. 7. An oxychloride of copper, usually in emerald-green prismatic crystals. 8. Regions lying between certain parallels of latitude. 9. Annual re-enforcements, to strengthen places where holes are made. 10. A city of Asia. 11. A letter.—REX FORD, Alplams, N. Y.

NO 130.—DECAPITATION.

(To Gaudin.)
The river wind winds to and fro,
Laid a last man without a guide,
Along the bluffs, now high, now low;
The river, like a radiant bride
Who seeks 'mid winding paths to hide,
But seeks in vain, has ever flowed
In rippling beauty close beside
The river road.

The river road 'neath Winter's snow
Is full of ice; King Frost's defied
Where swift the hobs and cutters go,
And o'er the ice the skaters glide.
When summer comes in all her pride
She maketh here her chief abode,
And seems more glad since she espied
The river road.

The river road in Spring can show
A spot to Nature near allied;
So thick the PRIMA flowers grow
Their blooms are crushed at every stride!
And withering Autumn, azure-eyed,
Hath her seat of rest bestow'd,
And with her leafy rainbow dyed
The river road.

Prize, you must own when it you ride
It will deserve a better ode.
You'll ne'er for lack of beauty chide
The river road.
—SWAMP ANGEL, Rock Falls, Ill.

PRIZES.

Best half-square, pyramid, inverted pyramid, and rhomboid, *Theodora* six months each; best anagram, charade, and transposition, this paper one year each. Open to all until Aug. 31.

ENIGMATA.

Some of the June puzzles were too tough for the solvers, not one securing a complete list of answers.—No 122 is a clever transposition and a clever piece of verse. More of its author's work would be very acceptable. —Pallas and T. Hinker are with us again, after a quiet absence. The latter's square, though pretty well tagged, is well put together.—Since our last issue appeared Nancy Lee, of Detroit, who was a regular solver of "The Enigma," ended his life by taking rough on rats, and the event taking place on the 10th ult. Our sincere sympathy is extended to his bereaved ones.—Julson has an International Dictionary and a few other reference books to dispose of. His address is: Chas. H. Julson, 86 Washington street, Norfolk, Va.—Frantz has thanks for contributions—one of which is used immediately, and a "complete" to July puzzles.
8-1-95.
R. O. CHESTER.

Light Railways.

The agricultural portions of France, Belgium, Holland, Germany, Austria, Hungary, North Italy, and Ireland have derived during the last few years no small benefit from the extensive construction of light railways. These steam tramsways, for they are little more, are designed to carry goods and passengers between districts previously isolated and stations on the ordinary railroads. They run, as a rule, on or by the sides of the highroads, and are built and worked in all respects at the cheapest possible rate consistent with efficiency. The appreciation with which the system has been received, and the rapidity with which it has been developed in Continental countries, testifies to its value.

A WORLD'S FAVORITE.

Fashions May Come and Go, But This Has Come to Stay.

This season has brought many fashions. But hundreds of the styles which have come will as quickly go and be heard of no more. One, however, is sure to remain.

It was caught up by the fashionable world as a desirable ornament; it was indorsed for its usefulness by the middle classes, and accepted by the masses as a necessity of life. It was a success—a success because it rested upon common sense. This universal fashion is the full-length overgarment. The Summer Girl travels immaculate from soot and dust beneath its dainty linen covering; the Mountain Maid, under its cloth draperies, shrugs her pretty shoulders at the Avian blizzards; when lined with warm fur it protects the Sleigh Belle against the Winter's cold; if made of checked water-proofing, it attractively shelters the Easter Lily from April showers.

Here is a case in point: Some years ago the head of the most successful health institute in America, the Invalids' Hotel and Surgical Institute, at Buffalo, N. Y., set out to make a much needed discovery which should be founded on common sense and appeal to the common sense of common humanity. This man, R. V. Pierce, M. D., author of the People's Common Sense Medical Adviser, of which more copies have been sold than of any other book published in this country, had from his long experience as a scientific investigator, physician and student of human nature, become convinced that the American people lacked nervous stamina. The very energy which enabled them to conquer a new land and develop it to the remotest rank among the powers of the world, was, he said, proving a task master which was driving men and women to physical prostration. Whether this prostration found its seat in the nervous system, brain, heart, lungs, stomach, kidneys, liver or blood, and whether it was called neuritis, dyspepsia, female weakness, "brain fog," insomnia, heart disease, or nervous prostration, Dr. Pierce reasoned, and very properly, that the cause was due to our high pressure manner of living. He found, furthermore, that these disorders could not be reached by the remedies of other nations or other times, but that these peculiar and hitherto unknown conditions called for a peculiar and hitherto unknown system of treatment. People who burned the candle at both ends did not need a stimulant, but a new means of strength, which could only be gained by creating new tissues, new blood and new nerve force. After long experiments, covering many thousands of cases, he gave to the profession and the public Dr. Pierce's Golden Medical Discovery, and Dr. Pierce's Favorite Prescription. These differ from all other medicines, compounds, emulsions, tonics and sarsaparillas as bread differs from straw.

The combined use of these medicinal compounds supplies a most efficient and scientific course of remedial treatment, that has proven marvellously successful in curative results in a great diversity of obstinate chronic diseases.

The aim of this common sense physician and the object of his common sense remedies, was not to give patients a course of temporary physical patchwork, but to go to the root of disease and effect permanent cures. The result is that in every city, town and county of the Union, merchants, farmers, mechanics and laborers, their

WIVES, MOTHERS, AND DAUGHTERS, have taken his medicines into their homes, and that they are there as household gods. His "Favorite Prescription" is increasing the outward attractiveness and the true inwardness of the "Summer Girl," the "Sleigh Belle," the "Easter Lily," the "Mountain Maid," the "House Wife and Home Worker," because it supplies the needed nerve and brain food, through enriched and vitalized blood, and thereby gives the true elements of new health, strength and life. Dr. Pierce's Favorite Prescription is of purely vegetable composition and is perfectly harmless in any condition of the system. It exerts a wonderful soothing, healing and strengthening power upon the delicate organism. It is an invigorating tonic for the whole system, and is almost an infallible specific for the peculiar weaknesses, irregularities, and painful derangements of woman.

DOCTORS' MISTAKE.

Careless, easy-going doctors frequently treat their women patients for biliousness, nervousness, dyspepsia, liver or kidney troubles, when the real sickness is in the organs distinctly feminine, and no help can come thence, unless the "Summer Girl," the "Sleigh Belle," the "Easter Lily," the "Mountain Maid," the "House Wife and Home Worker," because it supplies the needed nerve and brain food, through enriched and vitalized blood, and thereby gives the true elements of new health, strength and life. Dr. Pierce's Favorite Prescription is of purely vegetable composition and is perfectly harmless in any condition of the system. It exerts a wonderful soothing, healing and strengthening power upon the delicate organism. It is an invigorating tonic for the whole system, and is almost an infallible specific for the peculiar weaknesses, irregularities, and painful derangements of woman.

Serious illness often has its beginning in neglected little things. Even dread consumption comes on by degrees, and may begin with a very slight derangement. Taken in time, 98 per cent. of all cases of consumption can be cured. Taken in time, no disease need be really serious. The best safeguard against disease is an active, healthy liver.

GOOD, SOLID, HEALTHY FLESH.

The germs of disease seek out the weak spots in the body. Don't have any weak spots. If you have them now, clear them out, tone them up, make them strong. Dr. Pierce's Golden Medical Discovery will do it.

It searches out all poisonous matter and disease germs of whatever character. It regulates the action of the organs of the whole body. It forces out impure matter, makes the blood rich and puts new life into every fiber.

A GREAT BOOK FREE.

When Dr. Pierce published the first edition of his work, *The People's Common Sense Medical Adviser*, he announced that after 680,000 copies had been sold at the regular price, \$1.50 per copy, the profit on which would repay him for his great amount of labor and money expended in producing it, he would distribute the next half million free. As this number of copies has already been sold, he is now distributing, absolutely free, 500,000 copies of this most complete, interesting and valuable common sense medical adviser.

only being required to send a stamp to him, or the World's Dispensary Medical Association, of Buffalo, N. Y., of which he is president, this little book will be sent by mail. It is a veritable medical library, complete in one volume. It contains over 1,000 pages and more than 300 illustrations. Several finely illustrated chapters are devoted to the most delicate and sensitive woman. The *Free Edition* is precisely the same as those sold at \$1.50 except only that the books are bound in strong manilla paper covers instead of cloth. Send now before the books are given away. They are going off rapidly, therefore, do not delay sending immediately if in want of one.

FARMING IN MARYLAND.

It has Its Advantages and Disadvantages, with a Strong Balance to Its Credit.

EDITOR AMERICAN FARMER: I see in the July number of *THE AMERICAN FARMER* a letter from Mrs. Tappan, of Nebraska, asking about farming and farm lands in Maryland, and although I am in the midst of harvest, I feel it my duty to answer her inquiry briefly.

I agree with Mrs. Tappan that there is no poetry to the credit of farming at present. Indeed, the only thing on the credit side of this vocation is the independence, the fresh air and green fields and the absence of brick walks and steaming pavements; still, the condition of the farmer is the same in Nebraska as in Maryland.

However, I know that some farmers make farming pay here in Montgomery County. We are 18 miles north of Washington and 28 miles west of Baltimore. The nearest railroad is on an average of eight miles. We have good stone roads to market and mills, stores and Postoffices every two miles, with mails twice a day; churches of all faiths, a savings bank and a fire insurance company, farmers' clubs, ladies' associations, and granges. So you see all of our surroundings are conducive to pleasant social relations.

Now, to return to the farming in this locality. Many make dairying a specialty. They of course raise some wheat and corn and hay also. They get 50 cents per gallon for cream delivered within two miles of the farm, providing it will churn two pounds of butter to the gallon; the price of whole milk delivered at same place is 14 cents per gallon during the six Winter months, and 12 cents per gallon during the Summer months. There is some money made at this with careful attention, and combining the raising of pork, poultry, etc.

The best returns for hard work, patience and good management is from small-fruit raising and trucking. Strawberries have paid those who have gone into it intelligently very well indeed. I know of one man near me who made last year \$300 per acre, and hauled his berries 18 miles to Washington. This year berries brought seven cents in the neighborhood, and from seven cents to 12 cents in Washington, according to quality.

Asparagus is another paying crop; a party here cut \$250 per acre last year, and this year sold his crop at from 75 cents to \$1.50 per dozen bunches.



A Question of Pedigree.

"Now, who is that?" asked a dignified hen;
"That chicken in white and gray?"
She's very well dressed, but from whence did she
come?
And her family, who are they?
"She never can move in our set, my dear,"
said the old hen's friend to her, later;
"I've just found out—you'll be shocked to
hear—
She was hatched in an incubator!"
—Harper's Round Table.



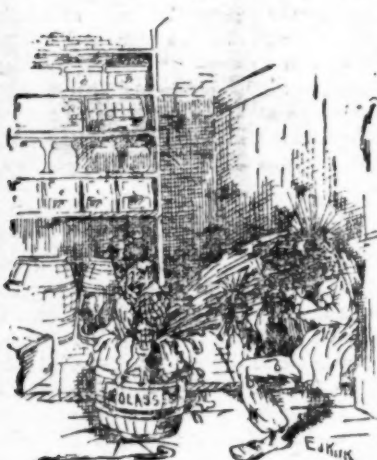
I.

Errand boy Tom on a lemon box stands,
Searching for candy with light-fingered
hands;
Behind, bringing cane, and a grudge in
his mind,
Comes Old Mr. Cate, with purpose
unkind.



II.

"By Gravy! that kid should a lesson be
taught,
"And now for revenge, sweet revenge,
that I sought."
So lifting his cane, as sly as a fox,
He quickly upsets the said lemon box.



III.

Up flew poor Tom's feet and downward
he came
Toward a cask of molasses, as if he'd
took aim;
Which shot out kersmack! knocking
Cute over flat,
So he got his revenge, very sweet, too,
at that.



I.

You Never Can Tell What Will Happen
When the Weather is Hot.



II.

While the feeding of a cow is subject
to the main principles of nutrition, it is
always the case that these may be properly
varied to suit the special circum-
stances of each case; and thus, when
we are feeding cows for butter,
especially, the feeding may need to be
different, to some extent, from that most
suitable for milk only. It is true that
the foods richest in fat are desirable for
butter making, but, as milk need not be
so rich in fat as for butter making when
it is made or sold for domestic uses, and
as the fatty foods are the most costly, it
is wise to choose cheaper foods for milk
only, and those that have less of the
costly fat in them. Buckwheat, for
instance, is one of the best milking
foods; but, having only a fourth as
much fat as corn, it is cheaper, and yet
will yield as much money in milk as
the dearer corn. This is an instance of
the advantage of understanding this
matter of feeding, by which money is
made by using cheap foods. Buck-
wheat is one of the best foods for quan-
tity of milk.



III.

—New York World.

THE DAIRY.

Skimmings.

Heavy salting will destroy the flavor
of good butter.
Ripen the cream uniformly; souring
is not ripening.

The longer a cow goes in milk the
smaller and richer the milk.
A cow in poor condition will be sure
to give her owner poor milk.

In salting butter the taste is of more
importance than preservation.

By curdling milk before setting the
animal and other odors can escape.

The young heifer should not be
allowed to go dry too early the first
year of milking.

It appears doubtful whether the worst
enemy to the dairy business is the oleo
man or the maker of poor butter.

In making butter, if color is to be
used, it should be added to the cream
before the churning is commenced.

If you have a careless hired man he
may accomplish something in the field,
but keep him away from the dairy.

The Pennsylvania Experiment Station
has found creameries in that State
where the loss of butter fat amounted
to \$10 a day.

Retail dairymen pay, but the man
who deals direct with the consumer must
be businesslike and gentlemanly and
wear clean clothes.

There is no profit in a 200 pounder.
Food, labor and interest amount to \$40
per year, and the 200 pounds of butter
at present prices fails to meet the bill.
The 250 pounder leaves a small profit
of the 300 pounder pays.

In cleaning the churn and dairy
utensils, a brush will be found much
more useful than a cloth. All vessels
for milk or cream should first be rinsed
in cold water to which has been added
washing soda, or a small quantity of
borax. They should then be washed
with warm water and scalded with boil-
ing water. Small wooden utensils should
be kept in cold water.

Prince Edward Island, says the
Watchman, published at Charlottetown,
has now 30 cheese factories, and the net
average for milk for the last three years
has been 70 cents per 100 pounds. The
same paper says of Mr. T. J. Dillon; the
Dairy Superintendent for the island: "He
has succeeded in a very short time
in changing nearly 3,000 farmers into
probably as many successful dairymen."

A small dairy managed by the owner
should produce a very much higher per-
cent. of income than a large one. The
feeding of a small dairy can be done
much more economically than the feed-
ing of a large one, it being easier to
provide a variety of food, and the owner
being a more interested workman than
a hired man, gives intelligent thought
and careful study to each operation,
from feeding the calf to the marketing
of the butter.

In Bavarian Algaeu the creameries
forbid straining the milk, and require
that it be delivered just as milked, in
order that they may judge of the cleanli-
ness exercised in the stable by each
patron. Their unstrained milk is with-
out doubt cleaner and keeps better than
the ordinary carefully strained milk of
Schleswig-Holstein. It is stated that in
Switzerland the milking is done with the
bent thumb and first two fingers, so that
the milk cannot come in contact with the
hand.

The little specks of white in butter
are nothing more than particles of sour
milk; better, perhaps, to say flakes of
pretty nearly pure curd, found most
numerously in buttermilk from a churn-
ing of sour—quite sour—cream, the
souring having coagulated the casein,
and these specks are about pure curd.
It is a great deal better to have them
float off in the fluid than to remain in
the butter, for their presence there will
decrease its price in the market, and it
is a sign that the butter itself is deficient
in desirable qualities.

Specks in Butter.

EDITOR AMERICAN FARMER: I saw
in the May issue of your paper, an
article headed "The Cause of White
Specks in Butter." I conclude the
writer refers merely to Winter churn-
ing, as we have no occasion to warm
cream in the Summer, hence no chance
of making them by heat. My experi-
ence has been that in Summer the
specks will form in 12 hours after set-
ting the milk. They will lie on top of the
cream and are white. I pick them and
drop into hot water and they will not
melt like cream, but are tough and leath-
ery; rolled it between the thumb and
finger they have the appearance of bits
of white paper. I have failed to find
the cause, or a remedy. Will someone
who has had experience with this
"specky trouble" give us some advice
on how to treat it?

Your article says "wash out the
specks." Yes, so we can; but, then, here
is another trouble: Too much washing
makes the butter white and oily, hence
unfit for market. As the old English-
man said: "It is just like hen ile."—Miss
DRAKE, Brunswick, O.

"I have a dear
little babe, and am
well. I thank Mrs.
Pinkham for this,
and so could other
motherless women.
I was a victim of Fe-
male troubles.
Lydia E. Pink-
ham's Vegetable
Compound
cured me."
—Mrs. Geo. C.
KIRCHNER,
351 Snodgrass
Ave., Brook-
lyn, N. Y.

WINTER DAIRYING.

A Way to Lift Mortgage.

Paper by Chas. B. Bower, of Grand Junction,
Iowa.

No branch of farming has remunerated
the farmer as well as dairying, and happy
he who has been fortunate enough to live
near a cheese factory or creamery, and
patronize same 12 months in the year.
He is the only man that went through
our past panic of hard times without
serious embarrassment. We farmers of
Greene County have not woken up to the
interests of Winter dairying—hardly to
Summer dairying.

We are tilling the soil from early
until late, and don't find time to care
for the dairy. As the dairy works
so profitably with our mixed farming,
while our land is adapted for graz-
ing, good meadow and pasture, hence
good for stock raising and dairying,
why not care for the cow? She is a
wonderful condenser of rough feed into
a valuable commercial product, a prod-
uct that always brings its commercial
value when properly manipulated by the
creameryman. Why let our neighbors
from Illinois and Wisconsin buy our
cows, grain and hay, and ship same to
their States, and condense into the fine
dairy products? Now if this were not a
paying business, they would not continue
it. We must breed and feed for dairy-
ing and cull our herds. Those that are
not paying their keeping must go.

We must keep our herds in good
thriving condition 12 months in the year.
Have the cows come fresh in the Fall
season, and with proper feed and care you
may have a profitable Winter dairy
cow. In regard to feeding to produce
best flavor of butter in Winter, nothing
is equal to corn fodder cut up before
frost, and sheaf oats cut on a feed cutter,
with good clover hay. This with a mild
ration of equal parts of corn ground with
cobs, oats and bran, fed twice a day, will
make an excellent feed for Winter dairy-
ing. Keep the cow well housed, not
leave her out in the cold all day, as it
would require too much of the above
ration to keep her warm.

Our Experiment Station claims that
100 pounds of dry matter will produce
74 pounds of milk, or three and one-
fourth pounds of butter, and one pound
increase of live weight, while 100
pounds of dry matter fed to the steer
will produce 10 pounds gain of live
weight; in other words, food that will
produce one pound of butter will pro-
duce three pounds of beef. Farmer A.
has a dairy of 18 cows, that are pro-
ducing less than 200 pounds of milk
daily, while B. has 17 cows that pro-
duce 400 pounds of milk a day.

Now we can at once see that B.'s herd
is the more profitable. Mr. B. has fed
as in the foregoing, and is getting good
returns, while A. lets his cows rough it
out in the cold all day; rough feed and
poor shelter. He thinks the corn and oats
he would feed would be a loss. You
can see A. is not a practical dairyman.
This his statement and check will show
at the end of the month. While B.'s
check will amount to \$80, A.'s will be
about \$35.

Now if we had 100 practical dairy
men like B. with a herd of 20 cows
each producing 200 pounds of milk each
per day for 300 days in the year, mak-
ing 6,000 pounds of milk per year, this
at an average of 85 cents per pound, would
make over \$50 per cow.

Just think of this amount paid out in
your immediate vicinity. How it would
lift the mortgages from the farms, build
up our towns and homes, and enhance
the value of our land.

I trust Greene County farmers will
soon wake up to their interests, and
patronize their creameries and cheese
factories, so we will stand second to none
in this grand dairy State, which has
carried away more honors at the National
Exposition than any other State in the
Union.

The Cream Separator.

The value of the cream separator is
more apparent now that it is made of
such a small size that it is adaptable to
a dairy of as few as five cows, or even of
three good ones. And the old fashion
of using a large dog or a sheep to run a
churn may be resuscitated and this
handy animal put in harness to work
the separator. It occupies about the same
time as an ordinary churning to take
the cream from the milk of three to
five cows, and it is far easier to work
a separator in this way by a sheep of
150 pounds than by a person of the
same weight. By and by it is possible
that the convenience of this addition to
a dairy may give rise to a new breed of
sheep especially adapted to the work, or
at least to a revival of interest in some
of the large breeds, as the Lincoln,
which is easily brought to a weight of
over 300 pounds.

The economy of this method of sepa-
rating the milk from the cream is more
evident at this season, when the heat of
the weather adds to the cares of the
dairy man or woman. As the work is
done as soon as the milk is brought in
from the milking, there is no more use
for the pans for setting it, only for the
cream jar and the cold closet in which
this is kept, and the dairy thus becomes
much less of a storage for milk than a
mere workshop to finish it off hand,
without the former troublesome method
of caring for the milk. If it had fortu-
nately happened that the butter extrac-
tor had proved itself a full success,
the butter-maker would have been still
further relieved from the most laborious
part of his business. But the cream
separator does away with more than
half the work, and thus deserves a
place in even a small dairy of four or
five cows.

It is a great mistake to allow the milk
to stand in the stable any time at all
after it is drawn from the cow. This is
far greater when it is cooled there, as is
often done.

THE ORCHARD.

Graftings.

A novel saw for felling trees consists
of a series of platinum wires made
white hot by electric currents.

Georgia claims to be the largest peach-
growing State in the Union. Her peach
crop in a good year has been quoted at
6,500,000 bushels.

Permanent sod, without fertilizing, is
an injury to the orchard. This has been
proved in the experience of nearly every
successful orchardist.

A sod orchard should be closely
watched, as it may begin to fail sud-
denly. Barn manure may be applied
to old orchards with good results.

The Hale Georgia Orchard and Nur-
sery Company, Houston County, Ga.,
owns the largest peach orchard in the
world, a single block of 100,000 trees.

The best preventive of black knot on
plum trees is spraying with Bordeaux
mixture. The only cure is to cut it off
and burn it, and then paint the wound
with linseed oil.

Tar has been used for tree wounds
with excellent results. It is by many
considered the best material used. Coal
tar and carbolic acid have been com-
bined with entire success.

California fruit growers feel encour-
aged at the success of the yellow scale
killer introduced two years ago. It is a
minute insect, known as the Chalcid fly,
which destroys the larva of the yellow
scale.

When well manured and cultivated,
the Cuthbert raspberry will yield a pint
of very fine fruit to a stool at each pick-
ing, and three pickings may be made.
This is equal to over 20 quarts to a
square rod, or 3,500 to an acre.

Pear trees, both dwarf and standard,
love good ground; if a little inclined to
clay so much the better, though any fair
garden soil will suit them. But they
must not be crowded, even if dwarf;
nine or 10 feet apart is close enough.

Better work can be done on the trees
with the thumb and finger than with
the pruning knife and saw. Disbudding
saves all the strength and vigor of the
tree that would have gone into the sur-
plus growth from being wasted, as well
as much after labor to cut away what
should not have been permitted to grow.

Keep down the suckers (sprouts) that
usually start up around the trunks of
fruit trees. They cut off much nourish-
ment the trees need and are a sad pic-
ture of neglect. Many newly-set trees
will now be benefited by being mulched
with grass or weeds, cut and laid around
the trunk so as to cover a space of two
or three feet around each tree.

Only three canes should be left in a
raspberry stool, and just now is the time
to select the best of the new ones and
cut or pull out all the rest. Then there
will be a good growth and strong plants
for next year. As soon as the fruit is
gathered, the old canes should be cut
away, and the new ones tied to the
stakes, so as to prevent injury by high
winds.

The best variety of the blackberry is
the Kittany, though it is subject to
the rust, which, however, may be avoided
by spraying the plants with the Bor-
deaux solution twice before the fruit sets.
Experience with this plant goes to show
that fertilizers, instead of stable manure,
tend to lessen this proclivity to this dis-
ease; and more space, as much as 30
square feet to a stool of five canes,
will be an additional help to avoid
this disease.

Treatment of an Orchard.

The treatment of an orchard is a
subject of importance and should be
well studied. If the land is so wet
that it needs drainage, it is not fit for
use on this account. The land must
then be drained, or the trees will not
thrive. The roots will run into the
drains and choke them, making double
mischiefs, for the land will soon be as
wet as before and the labor and money
will be lost. Clay land is not the best for
an orchard; a lightish, gravelly land is
better, and still more so if it is limestone.
It would be better to set the orchard
far from the house in lighter land than
in clay because of its nearness. If the
land is clay, but not wet, it may be
improved by subsoiling; that is, by
plowing in the furrow of a common
plow and immediately after it with a
bar plow—that is, one with a long bar
like a coulter that will break the sub-
soil and loosen it. This might be done
in a strip between the rows of trees
and about six feet wide, but near the
trees the land should be plowed no
deeper than a few inches, lest the small
roots be broken and the trees checked
in growth. It is a good thing for an
orchard to be sown with clover and
pastured by swine or sheep.

Hot Water for "Yellows."

It is claimed by a correspondent in
Mehan's Monthly for June that peach
trees may be cured of the "yellows" by
pouring boiling water around them.
This disease, he states, is produced by
root-fungus, and hot water is a well-
known remedy for all diseases the result
of root-fungus. The boiling water,
though cooling somewhat in its passage
through the ground, reaches the roots
sufficiently hot to destroy the fungus
without injuring the root tissues. This
treatment is, unfortunately, only prac-
ticable for trees growing near the house,
where they are convenient to the hot-
water range.

Peaches in Delaware.

Delaware is to have a big peach crop
this year. A careful estimate places the
number of baskets at 1,500,000, upon
which the farmers will realize \$750,000,
a revenue much greater than for the
past 10 years.

Hartford Bicycles

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\$60



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Superior in Workmanship

Strong and Easy Running

Hartfords are the sort of bicycle most
makers charge \$100 for.

Columbias are far superior to so-called
"specials," for which \$125 or even \$150 is asked.
It is well to be posted upon the bicycle
price situation.

The great Columbia plant is working for
the rider's benefit, as usual.

Columbias-\$100

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Established 1895. Send for 67-Page Pamphlet

PLUMS IN MISSOURI.

Result of This Season's Experiments.

EDITOR AMERICAN FARMER: The
growing of the finer European plums
and their progeny produced in this
country proving unsuccessful, our best
natives have been sought and improved,
so that we can at least have plums.
Growing about 40 varieties on my
place, most of which are fruiting, gives
me a chance to test them.

The Mariana and Pottowattamie are
already condemned, and no doubt some
more will be discarded.

FOREIGNERS.

Among the most promising are Bur-
bank No. 1 and No. 2. Quackenbush
and Niagara (a New Yorker) are good.
Richland, a strike between a prune
and our common damson, is also fine.

Up to this time we have no native
that surpasses the Wild Goose. Al-
though not so good in quality, it is the
plum for the miller. When the season
is over I may give a general report on
them all. We read frequent advice to
plant the Wild Goose near other plum-
trees, as they are not self-fertilizing.

The reason of this is because there are
two distinct Wild Goose plum-trees on
the market—the one self-fertilizing and
the other not.

I got mine from headquarters soon
after it first came out, and know it is
genuine.

I have two trees in one place and
three in another, about 100 yards apart.
All these trees are full and regular bear-
ers, while there is not another kind of
plum tree within 200 yards. One of my
choicest is the Louisa, one that ripens
about a month later than the wild goose,
nearly as large, a dark red all over, with
a nice bloom, sweet and well flavored.
All to whom I have given it pronounce it
superior. It is about as near free from the
effects of the curculio as any, for I have
seen it clean and sound on a tree along-
side of a Lombard on which all were stung
and failed to come to maturity. That
the Burbank is free from the little turk
is a mistake. Kelsey's Japan and Sat-
suma, that are lauded in the South, are
no good here. I have had them for 10
years, and not one plum yet; in fact,
the trees and grafts on other trees are all
dead.

APPLES.

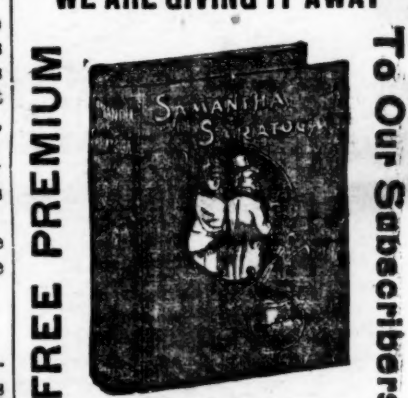
The apple crop here is the greatest I
have ever seen. After a severe thinning,
the trees are still bending beneath their
loads.—S. MILLER, Bluffton, Mo.

Spattering of Milk.

This nuisance in milking is caused by
some scales of the skin which are
loosening from the end of the teat.
This is the way the skin wears off and is
replaced by a new growth, and if the
scales do not quite drop off they remain
and interfere with the escape of the milk
in a clear stream. The milk is then
spattered as complained of. This is
prevented or stopped immediately by
scratching the end of the teat with the
finger-nail, by which the partly-loosened
scale is removed. Sometimes it is better
to have a small piece of smooth pumice-
stone, or of sandpaper, in the pocket,
and smooth the end of the teat by rub-
bing it a little with this.

\$2.50 Book, Free!!

WE ARE GIVING IT AWAY



BY JOSIAH ALLEN'S WIFE.

This book was written
"mid the world of fashion
at Saratoga, the proudest
pleasure resort of America,
where Princes of America,
with Congressmen,
Millionaires, Railroad
Kings, and Princes with
their wives, their beautiful
daughters, and all the gay-
est, brilliantest of fashion
luxuriate in balmy breezes,
display their personal
charms, costly jewels, ex-
quisite equipages, and
revel in
JOHANNES.

All the Extremes of Fashionable Dissipation.
"JOSIAH ALLEN'S WIFE." In a vein of strong
common sense keeps the reader enjoying
AN EVER FRESH FEAST OF FUN.

It takes off follies, flirtations, low-necked
dressing, dandies, pug dogs, bobbing, etc., in the author's inimitable and mirth-pro-
voking style. The
ILLUSTRATIONS BY OPFER ARE JUST KILLING



They say there is a sight of flirtin' done at
Saratoga. I didn't hear so much about it as Josiah
did, naturally there are things that are talked of
more amongst men than women.
Told him from the first on't that he'd better let
it rest alone.
But he seemed so. He said "I was more than
able enough married, men and women had
the more single ones," he said, "it was dread-
ful fashionable amongst partners."
"Well," says I, "I shall have nothing to do with
it."
There was a young English girl about to
the same place who did. She dressed some like a young
man, carried a cane, etc. But she was one of the
upper 10, and was as pretty as a picture, and I saw
Josiah had kinder set his eyes on her as Josiah
a good one to try his experiment with.

CRITICS SAY OF IT.

"Delicious humor."—Will Carleton.
"It is an avenger of the keenest sarcasm
on the follies of fashion."—Lutheran Ob-
server.
"So exuberantly funny, we had to sit
back and laugh until the tears came."—
Weekly Witness.
"Unquestionably her best."—Detroit Free
Press.
"BUTTERED BATTLE, COATED WITH THE
SWEETEST OF EXHILARATING FUN."—Buck-
Newman.

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